TECHNOLOGY DEPT.


# Gas Journal

Vol. 266. 103rd Year. LONDON, MAY 16, 1951. No. 4589. Price 1/-

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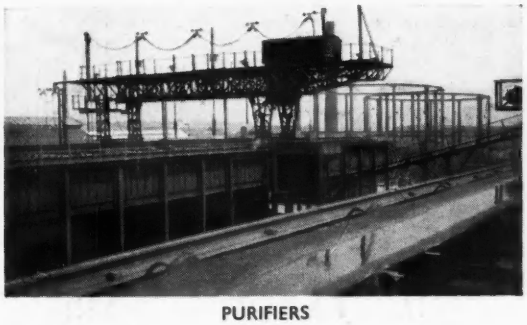

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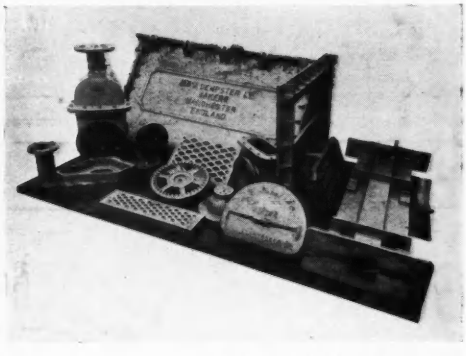

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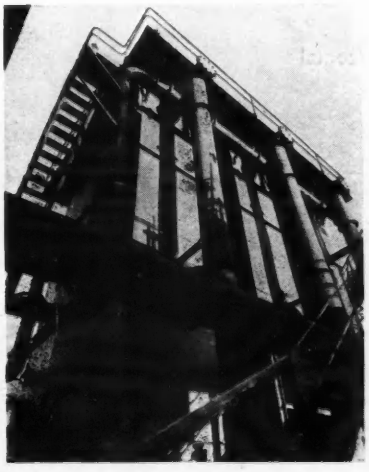

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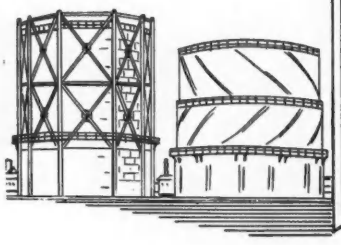

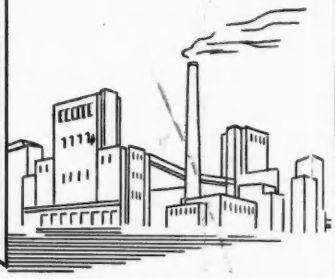

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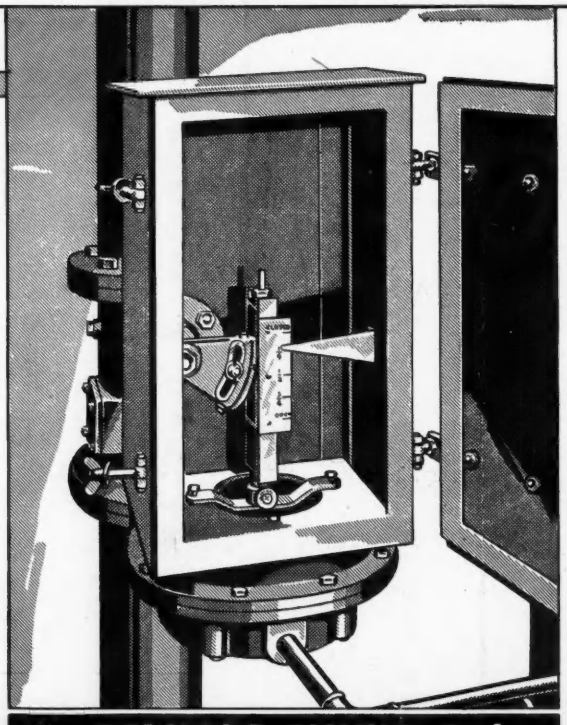

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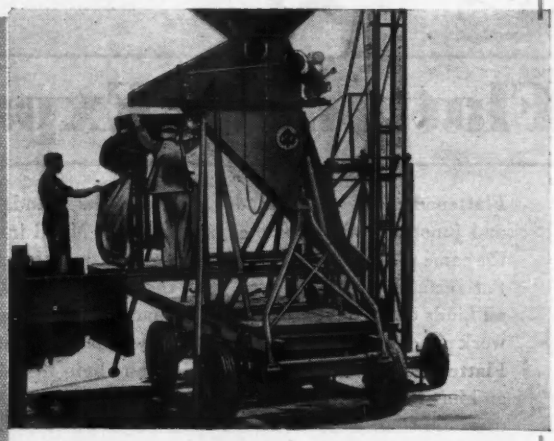

*(Above)* **DE-BREEZING, WEIGHING AND BAGGING**
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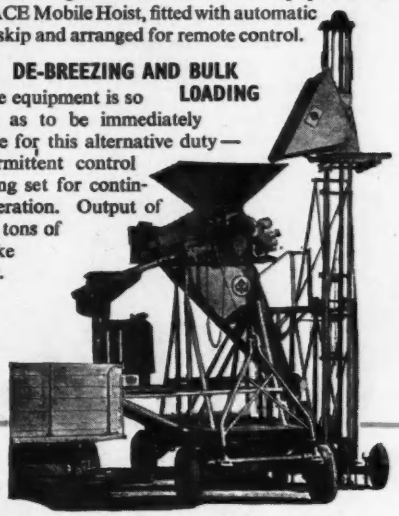

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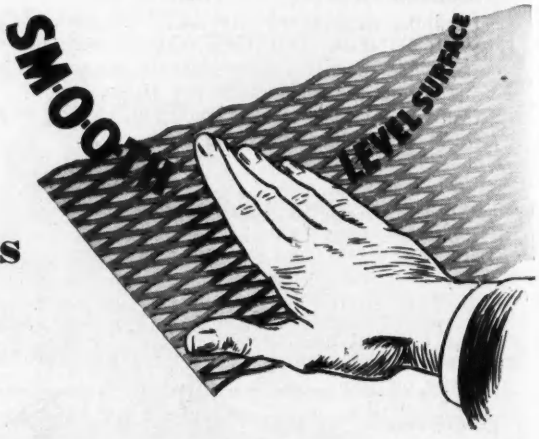


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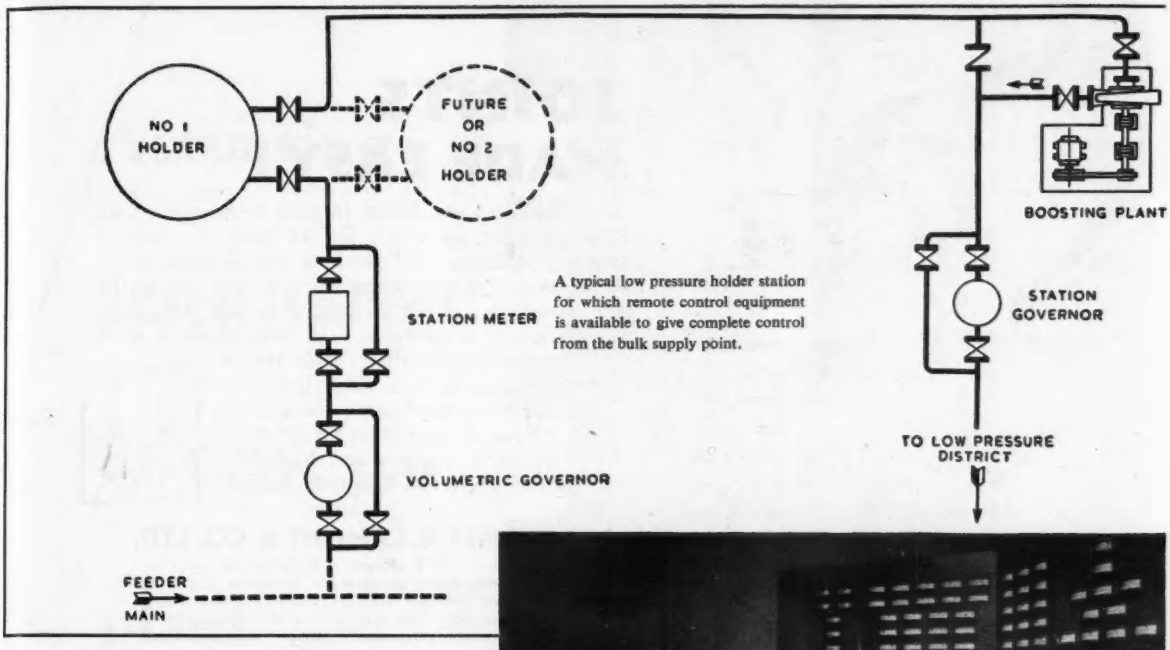


A typical low pressure holder station for which remote control equipment is available to give complete control from the bulk supply point.

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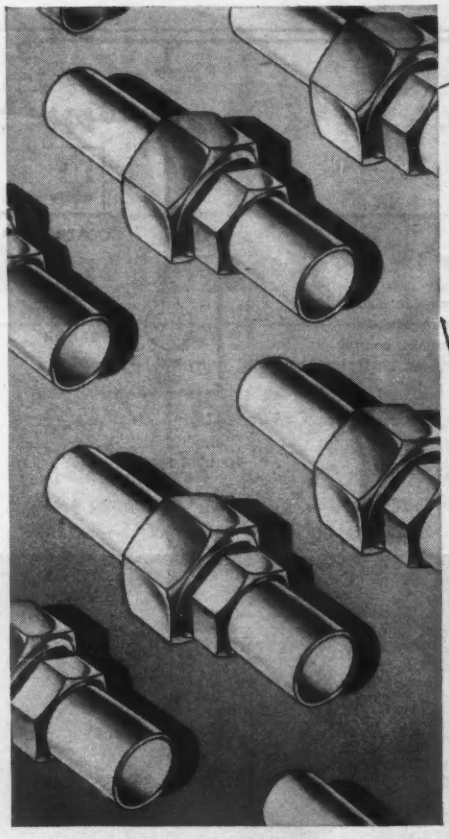

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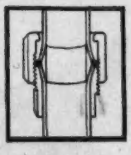

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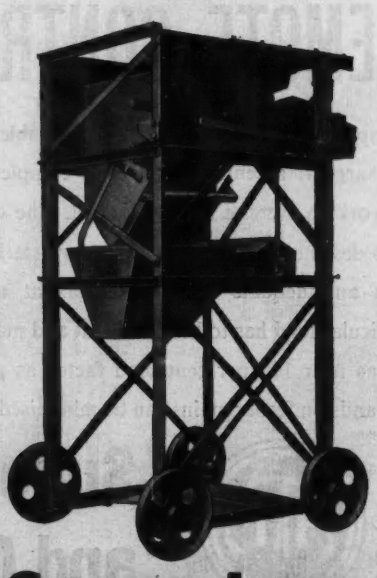

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Machines may be seen working by appointment.

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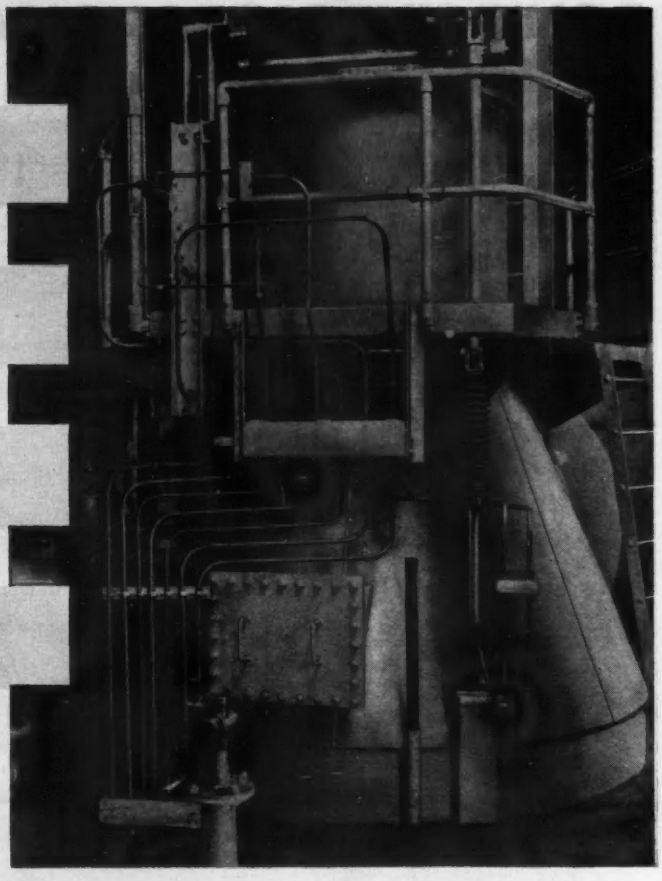
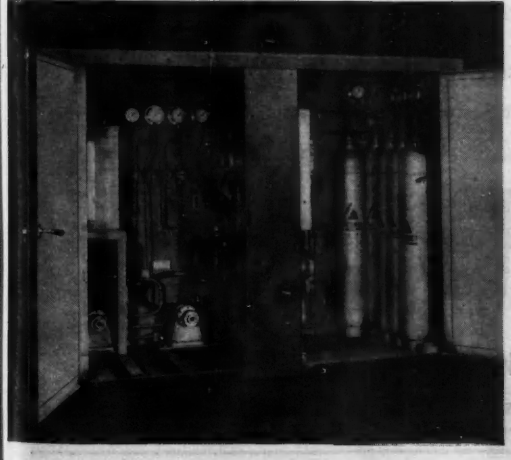
# Actuating stack valve of C.W. gas plant



More and more manufacturers of gas plant are following the lead set by the larger concerns in the incorporation of Lockheed industrial hydraulic equipment in their products, and the advantages are becoming more widely recognised by operators.

These photographs show, above, the stack valve of a P.G. carburetted water gas plant and below, the Lockheed power cabinet, which was originally developed to meet the Power-Gas Corporation's specification.

Lockheed hydraulic equipment for the industry includes sequence controllers and hydraulic operation for gas retorts, and also for valves: for the remote control of dampers: for the manual and servo controls for chargers, etc., and for rotary grate drives for producers and carburetted water gas plant.



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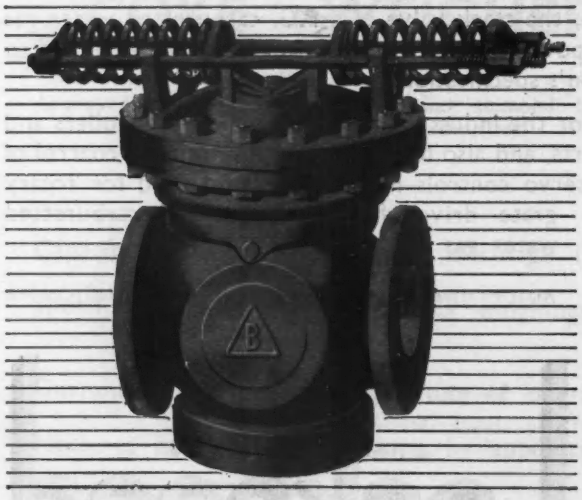

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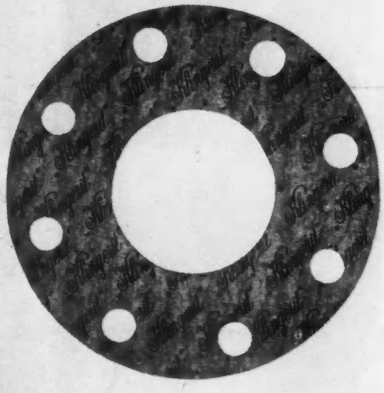

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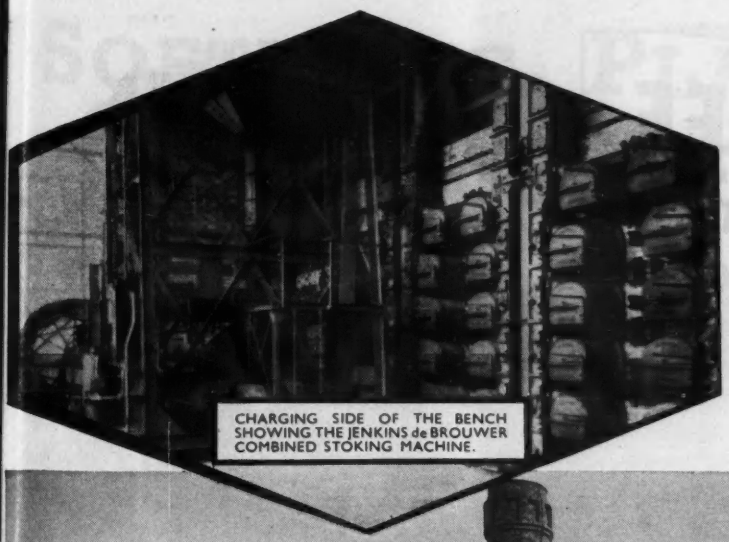
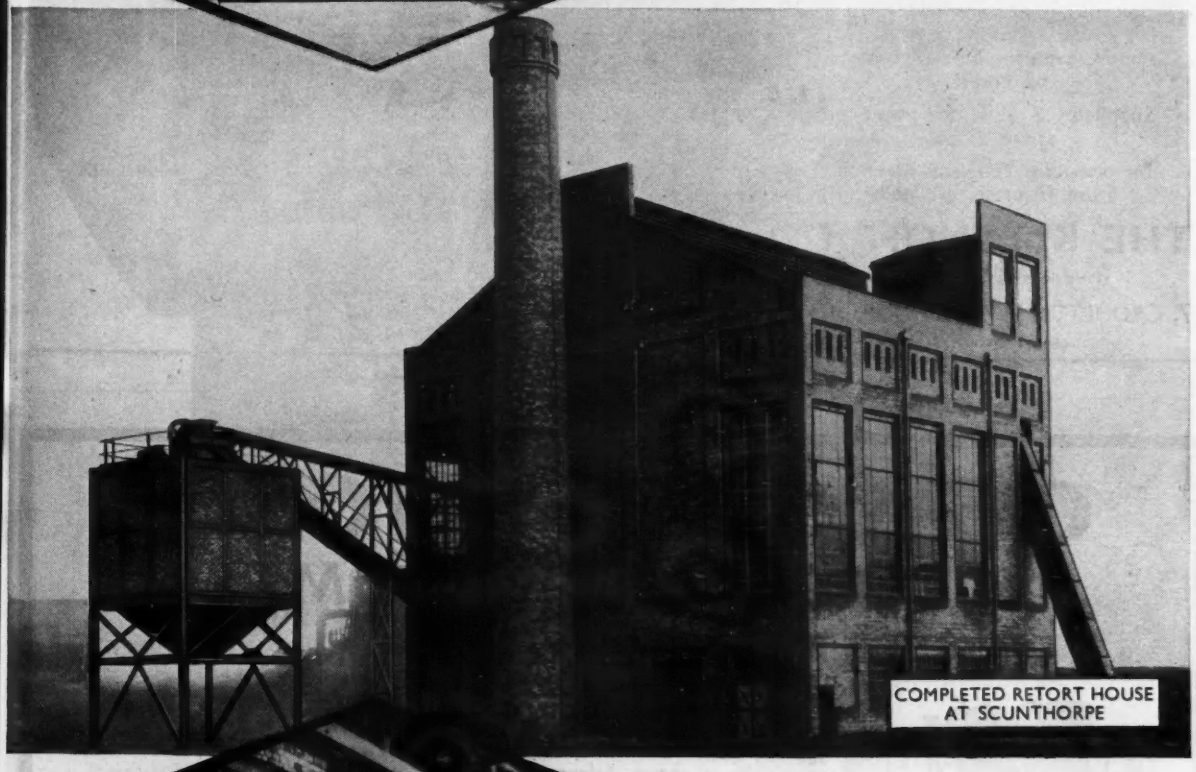


CHARGING SIDE OF THE BENCH SHOWING THE JENKINS de BROUWER COMBINED STOKING MACHINE.

# Horizontal Carbonising Plant at Scunthorpe



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PRODUCER SIDE OF THE BENCH SHOWING THE HOT COKE CAR.

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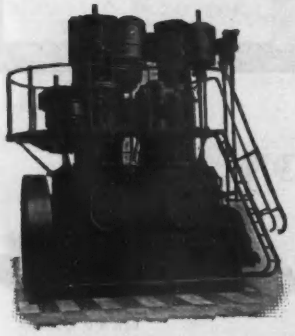

These double-acting cross-head type Compressors are provided with forced lubrication. They may be driven by any suitable power unit, as shown below, or by steam cylinders in tandem with the compressor cylinders making a self-contained unit, as shown on the left.

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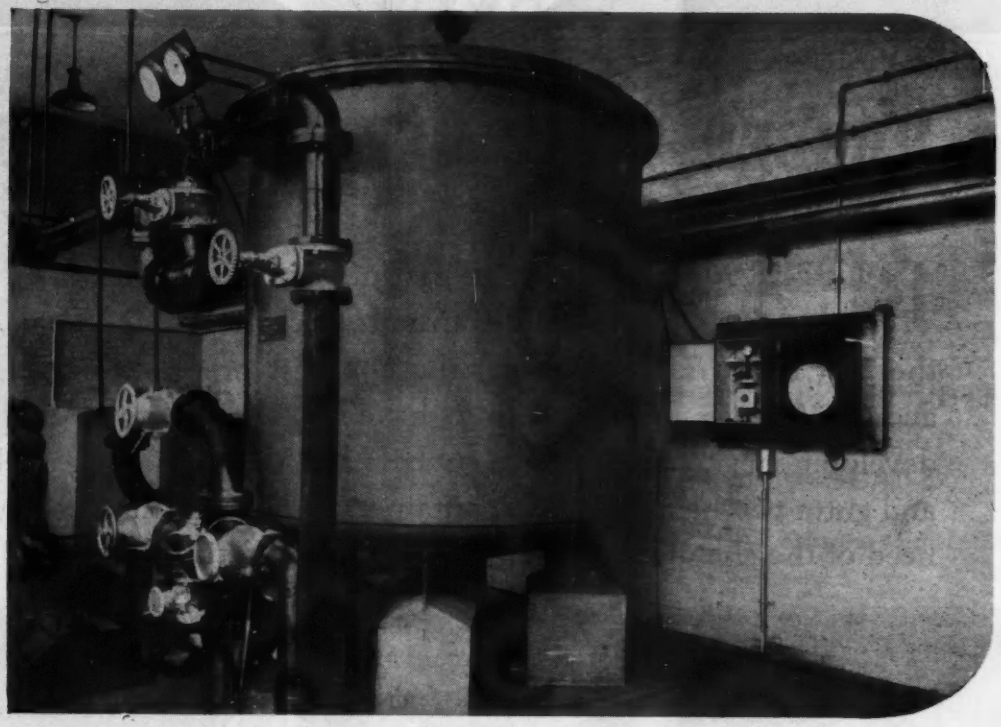

*By courtesy of T. C. Batteraby, Esq., Divisional General Manager, Watford Division, Eastern Gas Board.*

## At the St. Albans Gas Works

The illustration shows the 5,000 g.p.h. installation, stabilising lime softened water, at the St. Albans Works of the Eastern Gas Board.

This NEW DEVELOPMENT in modern water softening practice offers greatly improved quality of boiler feed as compared with the conventional lime/soda process alone, since it eliminates the excess lime which is responsible for "after precipitation," and controls alkalinity, thus reducing boiler water densities. The Stabilising process has been developed by FILTRATORS (Pat. Nos. 576014 and 576019) and can be applied either to the modernisation of existing lime softening plant, or can be incorporated in complete new installations using modern accelerated reaction technique.

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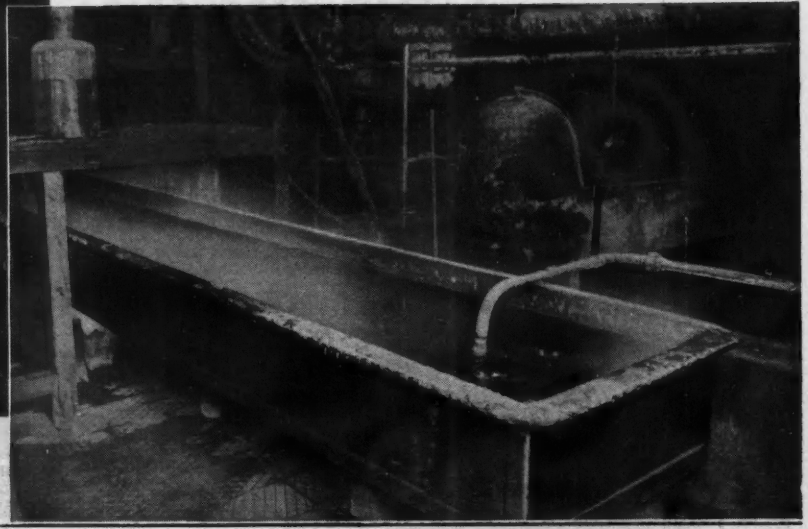

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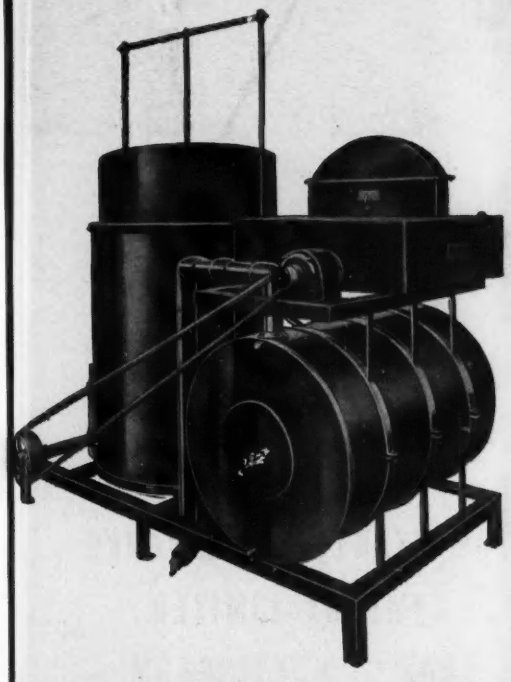

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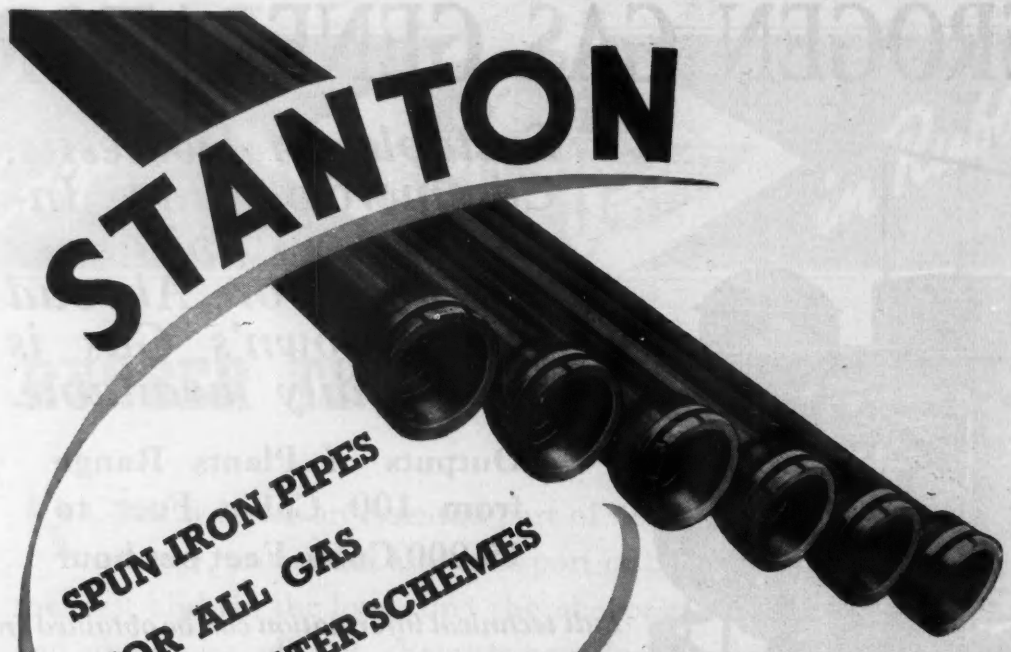

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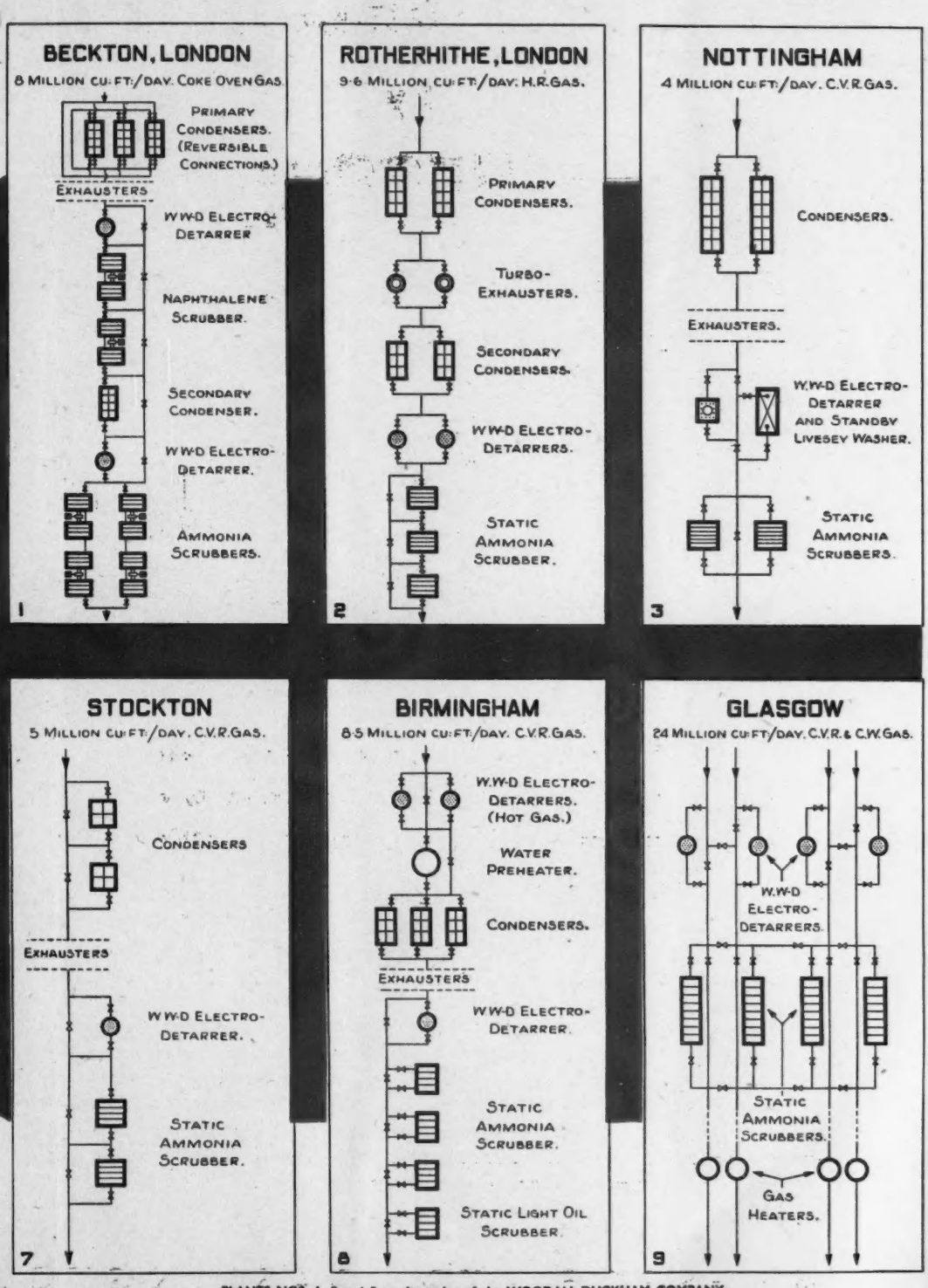


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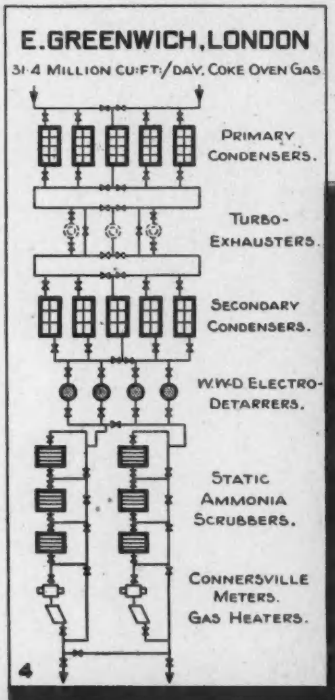


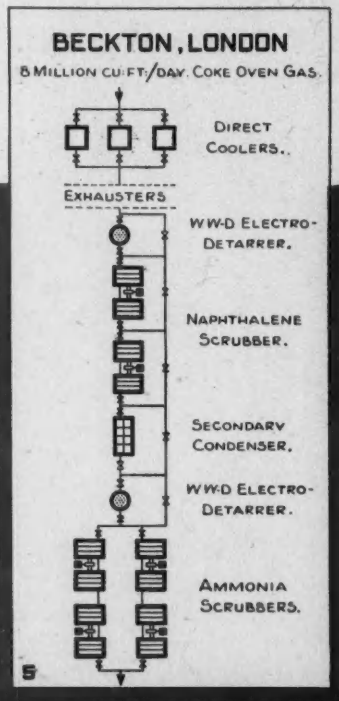


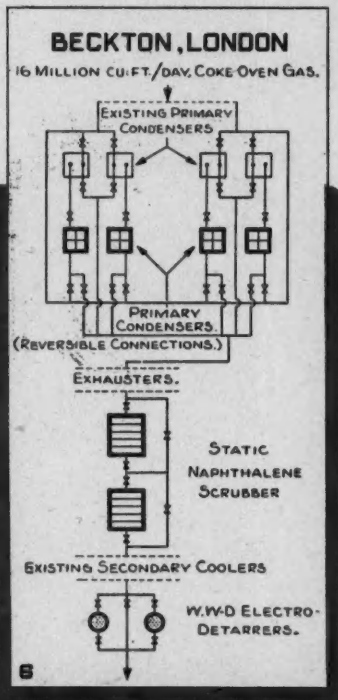


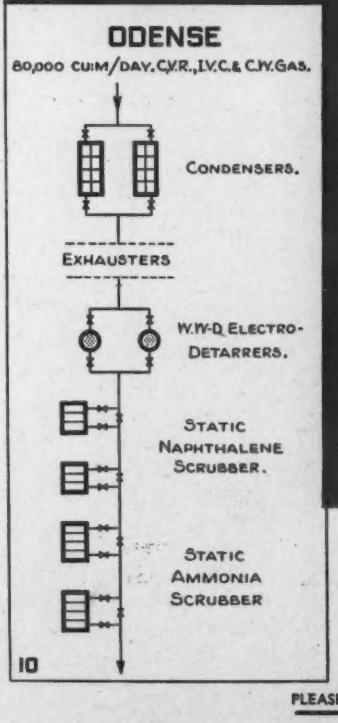


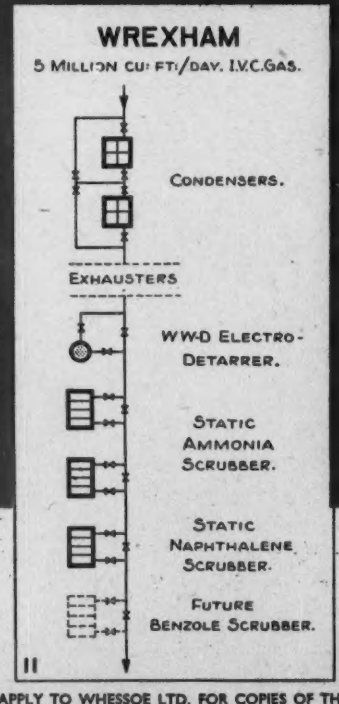


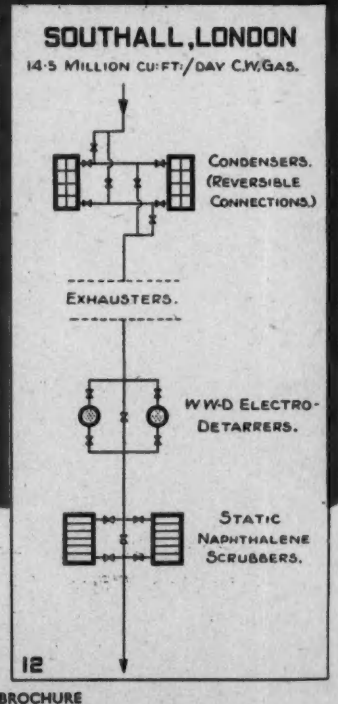


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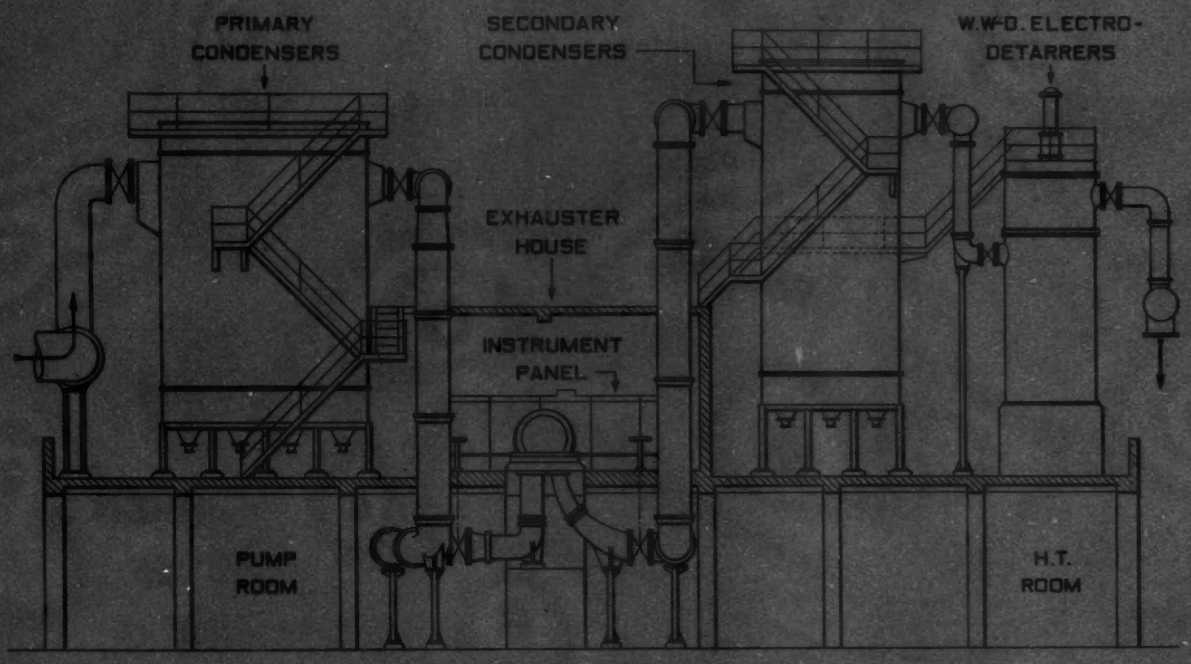
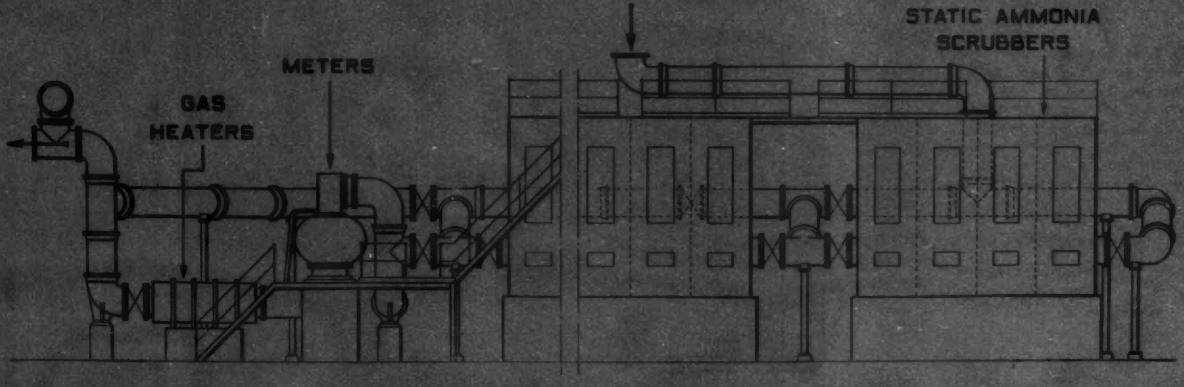



**Diagrammatic side elevation of the Whessoe installation South Eastern Gas Board, East Greenwich**

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# MODERN

# Wet Purification Plant

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Perspective illustration of a simple wet purification installation of a similar type to that shown in flow diagram 7 within

The flow diagrams on pp. 2 and 3 of this folder, two of which are illustrated on the cover pages, show the variety of unit plants and sequences which may be employed to accord with modern gas works practice, and to achieve the desired gas temperature, pressure and constituent vapour pressures, before entry of the gas to the dry purifiers. The requirements of Gas Undertakings vary according to the carbonising systems employed and the allowable capital expenditure. Individual preferences may be accommodated whilst still conforming with sound general practice. For further information on these important matters, please consult:

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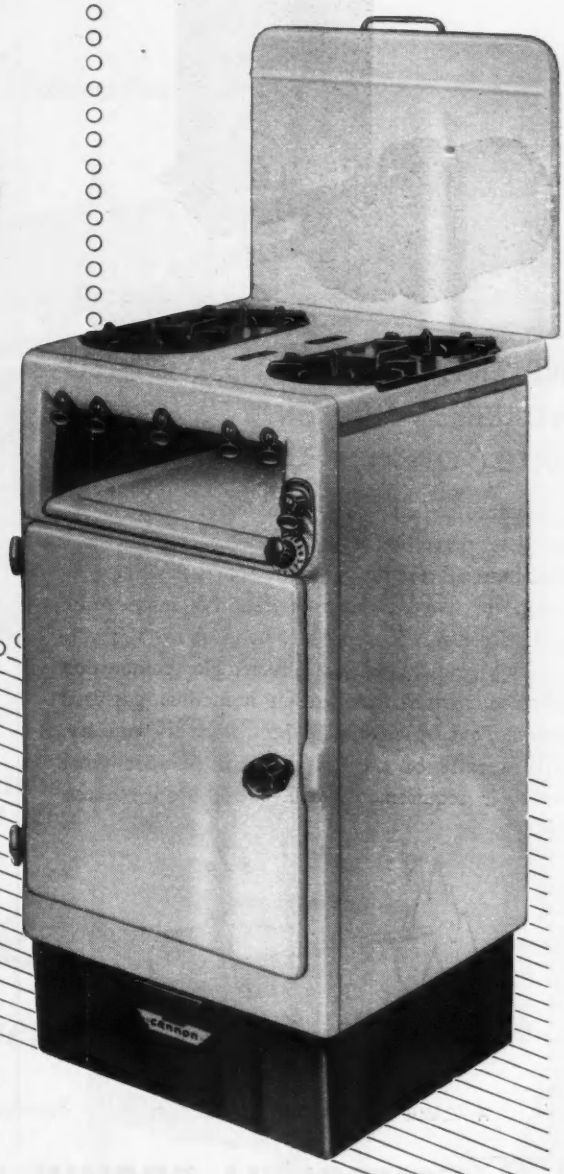


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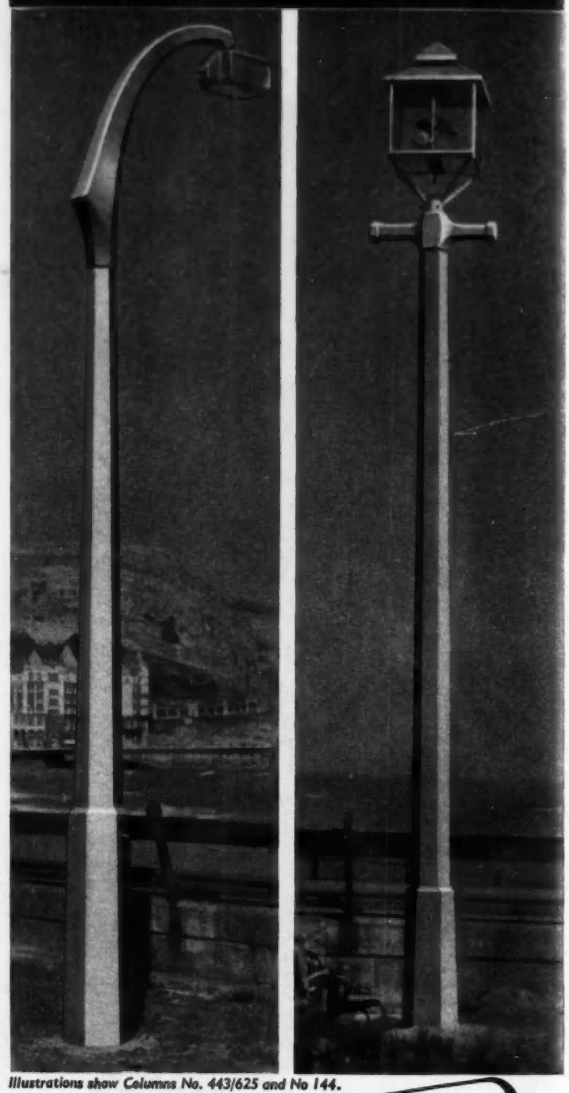

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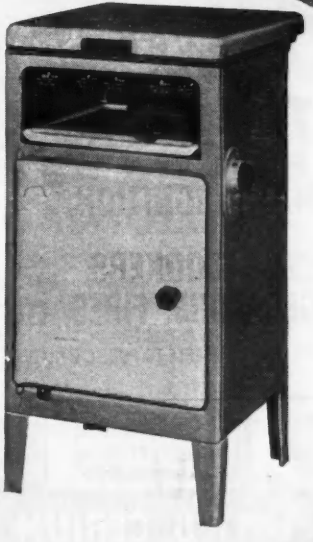

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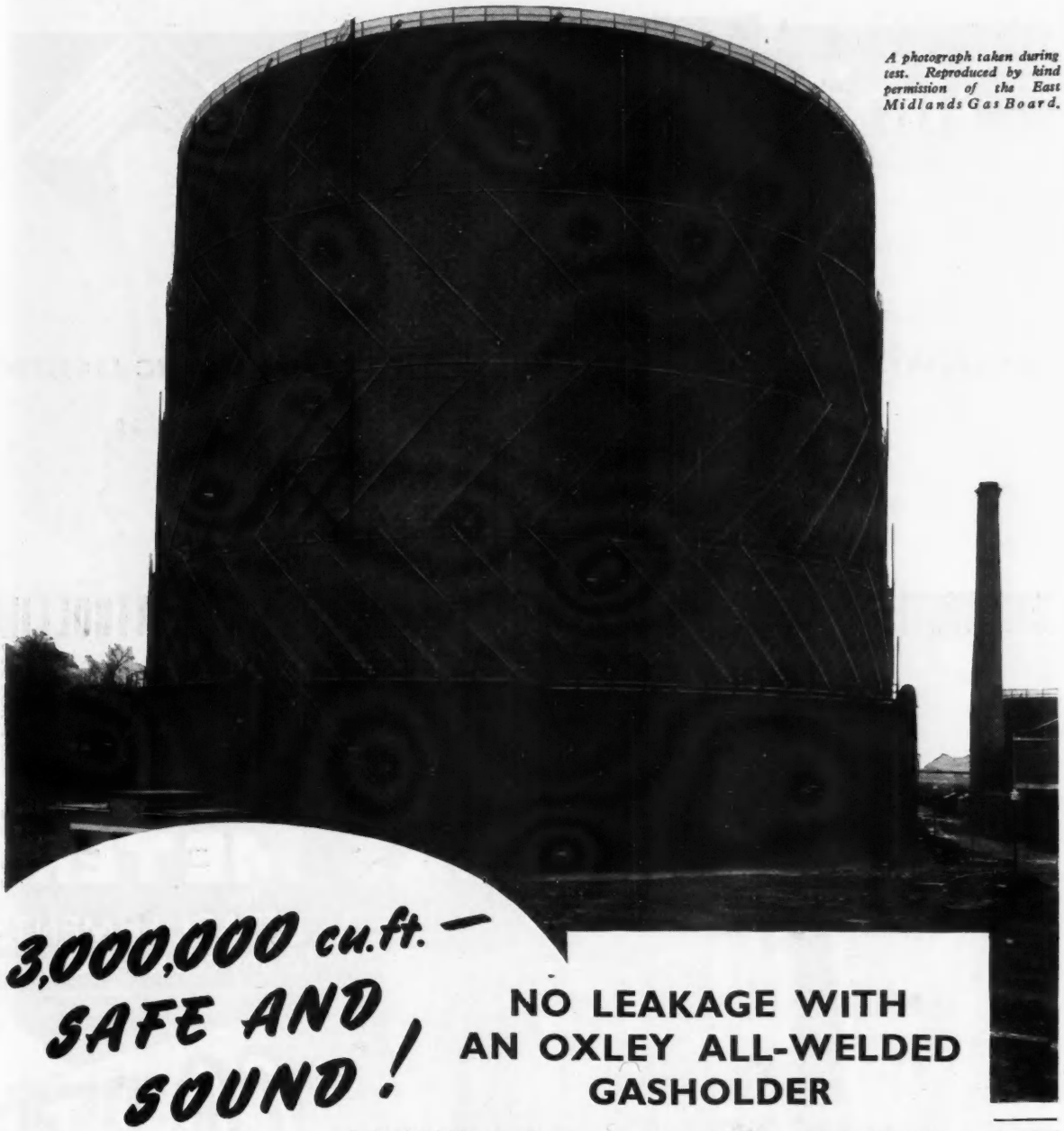

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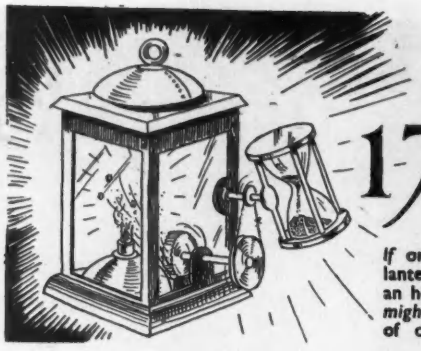

1769

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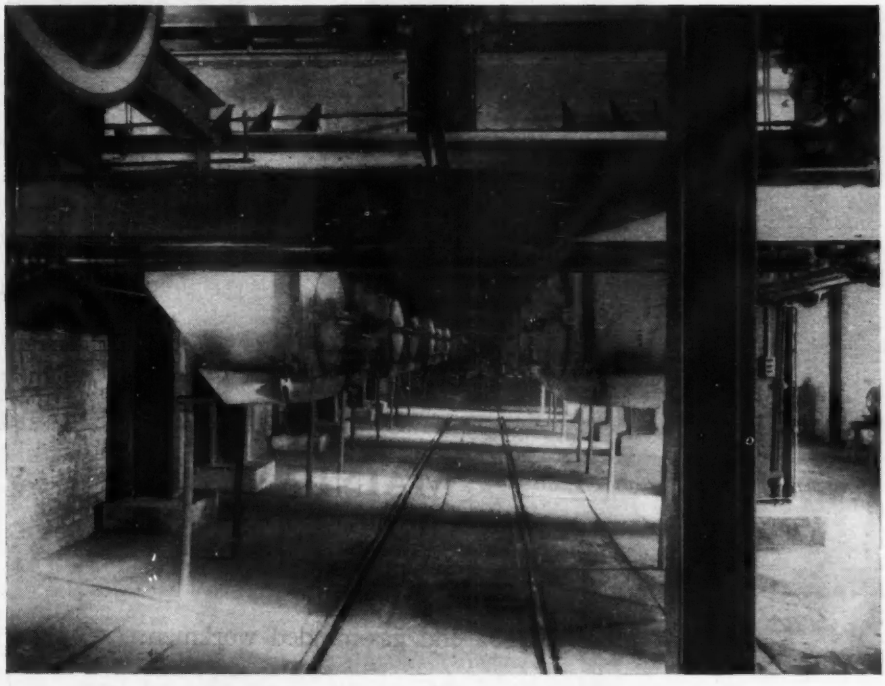

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*Unretouched photograph showing bottom mouthpieces of continuous Vertical installation.*

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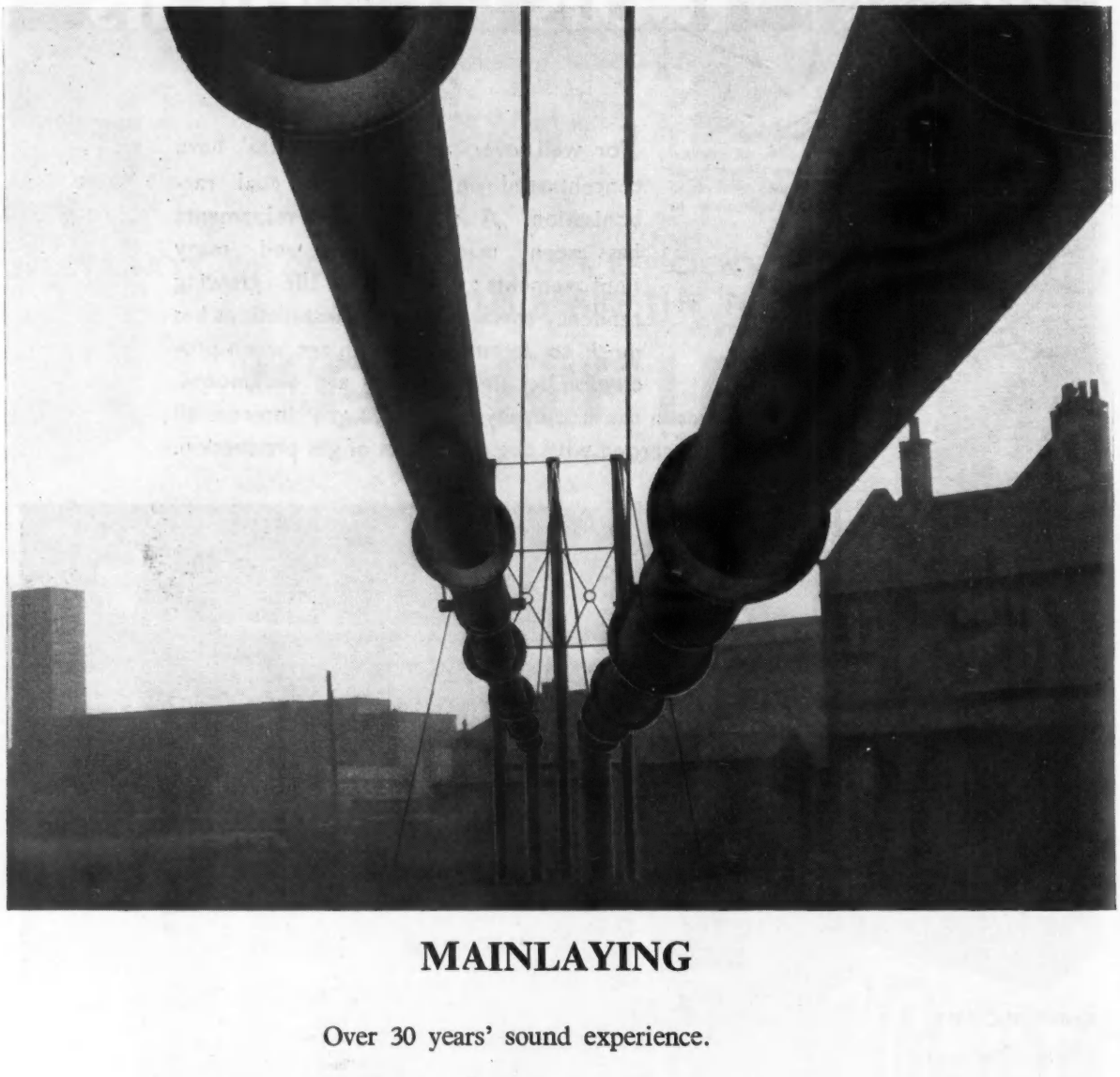

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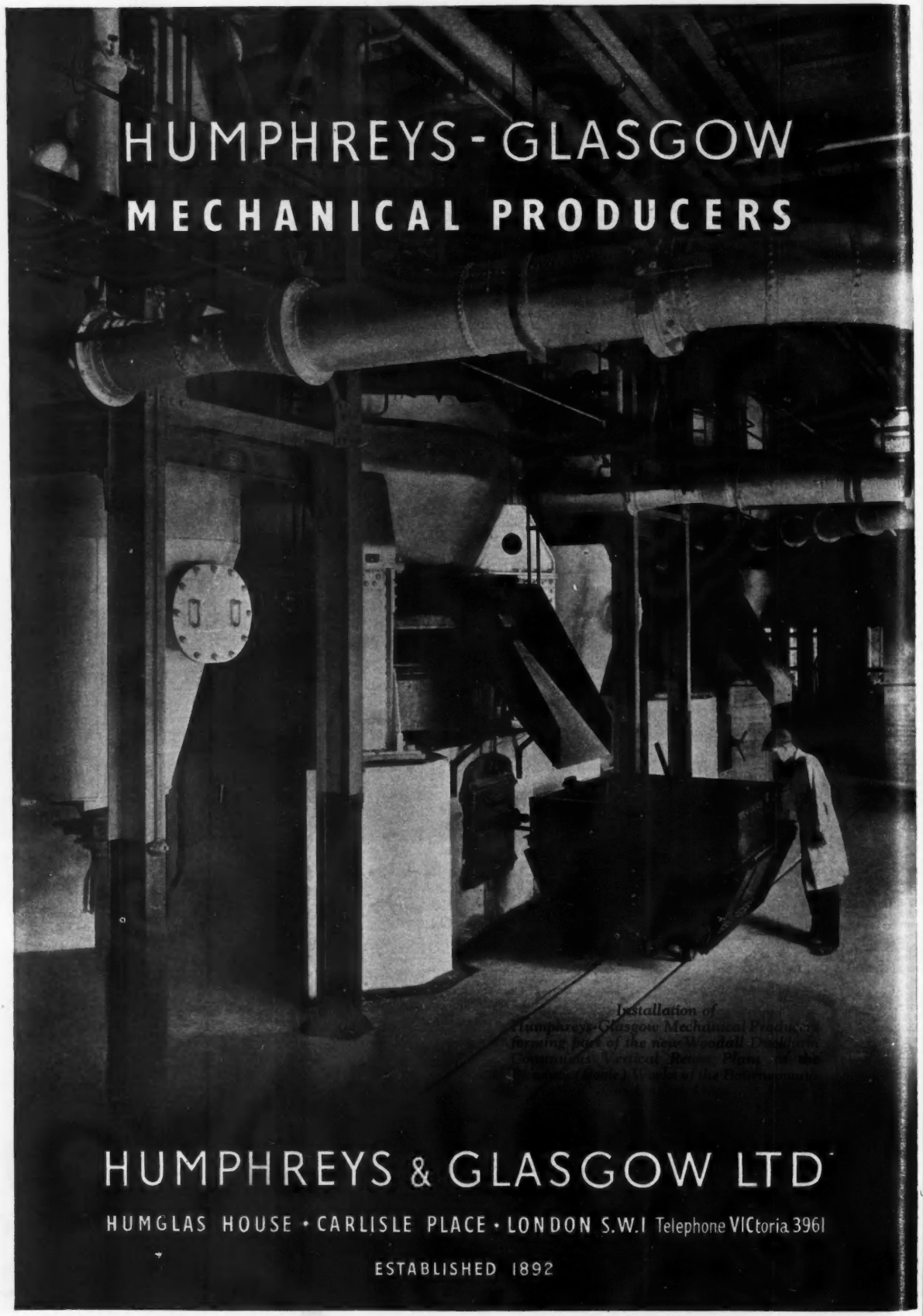
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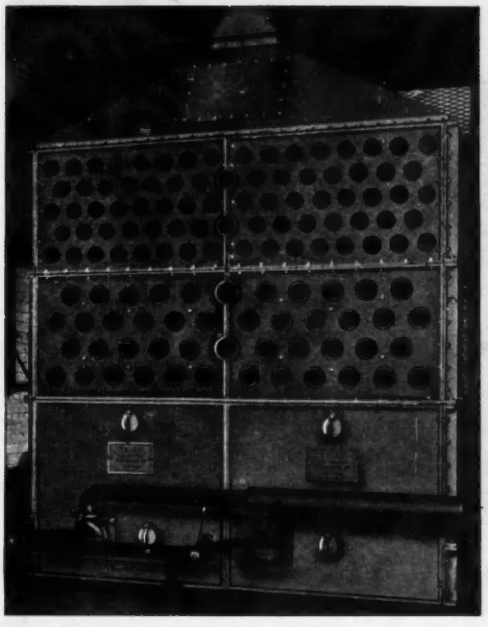

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# Gas Journal

*103rd YEAR OF PUBLICATION*

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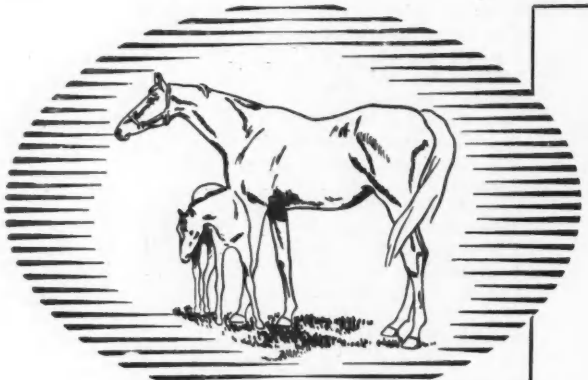

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# GAS JOURNAL

VOL. 266. No. 4589 103RD YEAR MAY 16, 1951

## BENZOLE RESEARCH

ON later pages we describe the new research station at Watford of the National Benzole Association, officially opened last Thursday by Sir Robert Robinson, O.M., F.R.S., Waynflete Professor of Chemistry at the University of Oxford and now a member of the Gas Council's Research Committee. Our pictures give some idea of the lightness and airiness of these new laboratories, in which a staff of 45 have every incentive by way of equipment to speedy and efficient investigation and testing; it is a great pity that Mr. W. H. Hoffert, Chief Chemist of the National Benzole Company, did not live to see his efforts crowned in the new and spacious laboratories, in the entrance of which a plaque in the very best of taste commemorates his work. At a luncheon following the opening ceremony and inspection, Sir Edgar Sylvester, Chairman of the Gas Council and President of the Association, mentioned that it will be 32 years next month since Sir David Milne-Watson was elected the first President of the Association. The close link with the gas industry has been maintained since those early days, and today two area board chairmen, in addition to the Deputy Chairman of the Gas Council, serve on the Executive Committee of the Association. Not that the Association is supported wholly or even mainly by the gas industry, for the organisation comprises the majority of the producers of benzole, and coke ovens produce the greater portion of the crude benzole. During 1950, 66 million gallons came from coke ovens and 26 million gallons from gas undertakings, and the function of the gas industry is not primarily that of a benzole producer. Economic and many other considerations influence policy from time to time in this regard, but with the present tendency towards larger manufacturing units in the industry the practicability of further benzole production appears more likely. In any case, the link between the gas industry and the National Benzole Association will not be weakened in the coming years, and we wish all connected with the new laboratories at Watford that measure of success which they undoubtedly deserve.

## NATIONAL FUEL POLICY

TO secure an impartial discussion of any wide subject it is necessary to enlist the services of men with knowledge and experience as wide, or nearly as wide, as the subject itself, men in positions of financial and social independence, in possession of minds of complete honesty and integrity, trained in scientific method. Such men are not easy to find. Specialisation militates against breadth of mind. Men who know most about technique find themselves caught up in big organisations, whether national or private, whose financial and other interests impose restrictions upon the expression of opinion. Independence of mind tends to wilt when views to be expressed are subject to the approval of the Public Relations Officer. No man at any time before the end of his career can afford to neglect the effect of any expression of his personal opinions on his chances of promotion. And however willing a great employer may be to listen to criticism of policy in private—a wise employer encourages and expects it—he must have careful regard to the effect of the public utterances of members of his staff on the financial interests committed to his charge. 'Loyalty to the firm' has a similarly restrictive influence upon the speaker himself. Specialisation has another effect, warping upon the judgment. A lifetime spent in one branch of industry, some of it in propaganda, most of it in supporting its claims to a high place in the national economy, inevitably tends to a certain 'channelling' in the action of the mind.

There is yet another impediment to impartial judg-

ment, found in publicists without interests or practice in modern technique. Not depending upon any industry for promotion or support they may be expected to be impartial in judgment. But prejudice, a certain trend of fashion in talk and particularly in literature, will turn the mind of even the big statesman in certain directions. He accepts as almost axiomatic that civilisation is synonymous with electrification. He makes such generalisations as that the industrial position of a nation is measured by the power consumption per head of population. To-day he looks to atomic energy as the cure for all fuel shortage and the control of fissionable materials as the mainspring of world policy. His generalisations are seldom definitely untrue but they tend to overlook some of the fundamental scientific facts which govern the durability, the replaceability of the natural resources of the earth.

Mr. J. F. Ronca is free from all these temptations, limitations, and prejudices. He is approaching the end of a long and distinguished career in which he has seen at first hand, without being immersed in too much detail, an immense number and variety of processes and installations for the utilisation of fuel. And he has seen all that at a unique angle. Impartiality of judgment has been as much his speciality, matured and perfected by long practice, as manipulative skill is that of the working technician. His utterance, therefore, on the question of a national fuel policy, its enunciation and discussion, will be studied with attention by everyone who appreciates the vital importance of the question. We have wisdom in his very first sentence. It is not the function of the Institute of Fuel, or any other technical body to 'elaborate a national fuel policy'. The responsibility for that rests fully and squarely upon the shoulders of the Government. But the Government cannot accomplish the task without outside advice and assistance. And it is not likely to get down to the task of at all unless spurred on by a formidable and enlightened public opinion, in advance of which Governments rarely act. The part which should be played by such bodies as the Institute of Fuel and the other institutions concerned with fuel technology is to formulate the principles, from the technical and scientific points of view, upon which such a policy should be based. There is no harm done if from time to time such bodies put up the outlines of a fuel policy which in their view might be considered in the final selection. The rank and file members of these institutions will generally be hampered in discussion by the considerations we have already mentioned—but there is no reason why they should not attempt to invite, whether from among their own membership or outside, men of such independence and eminence as they can find to address them on this subject and to lead discussions which might then be conducted in comparative freedom. And here it might be remembered that a national fuel policy will need revision from time to time. Vacillation would be a weakness but flexibility would be essential—witness the Near Eastern oil situation to which Mr. Ronca himself referred.

In such discussions Mr. Ronca's wise remarks on the meaning of such terms as economy and efficiency might well be borne in mind. Economy, he says, should be associated with basically sound operation, with good housekeeping, wise husbandry, operation without avoidable waste rather than with operation at minimum cost or downright niggardliness. In our present national fuel situation economy in coal is probably more important than economy in money. But even such a statement will not appeal conclusively to the fuel technologist, because he knows the great variations in coal and particularly in the different availability of the several varieties. He knows that no policy is satisfactory which does not provide for priority of economy in those types of coal which are likely to be soonest in short supply. And that is only one of the principles underlying a sound policy of coal economy. Efficiency is another word against the abuse of which we are warned by Mr. Ronca. 'Efficiency in the sense of overall merit in operation without avoidable waste is greatly to be prized and sought for.' There is a sentence which might be adopted as a motto in future discussions of tentative national fuel policies.

Thermal efficiency, can, as everyone knows, be obtained at costs which are out of all proportion to its overall effect in cost of production.

There are many points in this rich address, points made with a neat economy of words. We select only two more. We are urged to remember that in our own meetings we are preaching to the converted. How can we get our gospel to the multitudes (or rather the select few) outside? 'Whether we like it or not money talks'. The difficulty of course is that money talks in so many ways and that money is not a constant but a variable. Money will not help if the basic raw materials are exhausted. And, finally, the exhortation to the Institute of Fuel to stick to its last. Most of the time we should agree with this, but we do think that such occasions as the presidential address, not only of this particular institution but that of all the associations concerned with the fuel industries, might be used to give a lead to the public and to the Government in this vital and urgent matter of the formulation of a national fuel policy. In this respect Mr. Ronca's address ranks high.

---

## *HAIR APPARENT*

TWENTY-THREE Argentine footballers and three managers (obviously a nationalised industry) came down to breakfast at their London hotel the other morning puzzled and indignant men. Their sense of propriety was outraged. They felt they were failing to maintain the traditional standards of decorum expected of a great meat-producing country. They gesticulated and pointed meaningly at their chins. Not one of them knew any English. Not one of them had an ordinary razor—the Argentine football team are all-electric so far as shaving is concerned —*and there had been a power cut!* The manager of the hotel, however, rose to the occasion in a manner which suggests he is a loss to the diplomatic service. In French, a language which was fortunately understood, he was at pains to explain that this was neither an old English custom (at any rate not very old), nor yet a practical joke to welcome overseas guests. 'The government's electricity company,' he pointed out, had cut off the current—and

there was nothing he could do about it; but (and here comes the real diplomacy), because he cooked by gas, they could have breakfast. So the Argentine footballers had an excellent breakfast, cooked by gas, and set out for their morning's training at Highbury hairy but humoured. Was it coincidence that the result of the match—a 2-1 victory for England—was such a close shave?

## *SOLID PROGRESS*

SHAREHOLDERS of Parkinson & Cowan, Ltd., have no cause for dissatisfaction with the results of their company last year. Sir George Jessell, Bt., M.C., the Chairman, in his address at the fifty-first annual general meeting (a report of which is published on a later page of this issue) in no sense exaggerated the position when he described the year as one of 'solid progress.' Consolidated net profit, at £122,741, was up by £42,434; and after allowing for the preference dividend there is a 25% return on the equity capital. The dividend is maintained at 7%, but the total distribution is increased by the addition of a 2% bonus. The overall liquid position is very sound, with current assets exceeding all liabilities by more than £1 mill. As regards the future, this group of companies—like most other major industries—is faced with serious shortages, and Sir George Jessell struck a wise note of caution when he observed that, while the current year had opened satisfactorily, the final results are not likely to better last year's performance. The gas industry will await with interest the appearance of the new 'Paragon' gas cooker, announced at the annual meeting. This is designed by the Parkinson Stove Company for the 'popular' market, and outstanding technical performance is claimed.

## *ABERYSTWYTH*

GROUP committee chairmen and conveners, group accountants, and chief officers of the Wales Gas Board have recently had their half-yearly opportunity of talking over their problems with Board members. It was the fifth of the Aberystwyth conferences, which had their origin a month before vesting date, when the general problem of the transfer of the industry to the control of the Board was discussed. The success of the first conference was so great that the Board decided to make the conference a permanent feature of its organisation, and has since held conferences at intervals of six months. Before the conference each chief officer prepares a paper comprising all advice or suggestions on matters for which he is responsible which the Board wishes to bring to the notice of undertakings. The general aim has been to dispense with circulars, except on urgent matters, between conferences. Members of the conference—and this time the gathering included a number of engineers and managers not actually chairmen or conveners—discuss and criticise the papers, all in the presence of Board members and chief officials, in a spirit of mutual collaboration. Group leaders go back and hold group conferences in each of the 18 groups, so that every manager can question and criticise Board policy before it takes effect. The 'Any Questions' session provides a safety valve for those whose particular problems are not otherwise dealt with. As stated in the report of the latest conference on p. 436 of this issue, questions and comments were not lacking and the standard of discussion on gas industry policy was higher than ever.

## *CHARGES BY THE SQUARE YARD*

OUR friend 'Vulcan'—well-known 'Trade Chat' columnist of the *Ironmonger*—is always quick to spot points for criticism in our nationalised industries. (And all power to his pen, we say, where his criticisms are justified, as they usually are.) Having worked his readers up to the right pitch of enthusiasm by asserting that the aims of some administrators of nationalised industries appears not to be what they can save but to try to make their job look more important than it was under private enterprise, 'Vulcan' proceeds to draw attention to his gas bill. With the current trend of gas prices it would not be surprising if the great majority of consumers drew attention to their gas bills. But our contemporary makes a more subtle point. Although we seem to detect a tinge of bitterness in his observation that the least said about the amount the better, he passes over this aspect with commendable self-restraint. In fact, he comments not so much upon the size of the bill as upon the size of the books in which his payments are recorded and from which the receipt slips are torn. He is a most methodical man, for he was in the happy position of being able to turn up in his old bill file some of his accounts rendered and paid in the 'bad old days' (the quotation marks are his). Why, he asks, must the gas board use 74 sq. in. of paper for a transaction for which 52 sq. in. sufficed for its predecessor in 1947? 'Vulcan' is nothing if not fair. He also checked up on his electricity accounts—to find that in this case the area of paper had grown since nationalisation from 70 to 85 sq. in.

## *A WORTHY CAUSE*

THESE are not the days when appeals of any kind, no matter how deserving, find a very ready response. Too many people are already dipping deeper and deeper into our by no means bottomless pockets, and more and more do we appreciate the wisdom of the old adage that 'charity begins at home.' Nevertheless, we are going to commend to our readers what we believe to be a most worthy cause and one, moreover, which if it does not begin may very well end at home. We refer, of course, to the Institution of Gas Engineers Benevolent Fund, which has lately been the subject of special mention at meetings of district sections. The position of this Fund, like all funds supported by voluntary contribution, is giving rise to anxiety, which the rising cost of living does nothing to mitigate. While the membership of the Institution is steadily increasing—it has gone up by nearly 1,000 in the last decade—the percentage of members contributing to the Fund has just as steadily fallen, and is now below 50%. The very fact that membership is increasing means that in time there will be still more calls upon the Fund.

Some may question why funds of this kind should be necessary in a 'welfare state' in which a benevolent government watches over us from the cradle to the grave (and thereafter hastens to reimburse itself for out-of-pocket expenses by imposing a duty on dying). The calls upon a benevolent fund, needless to say, may fall largely outside the scope of any statutory provisions or commercial insurances and for that reason are deserving of the fullest sympathy. The regular contributors to the Fund will be conversant with the types of case which receive assistance; they are many and varied. Here are just a couple of examples: An annuity to a member (aged 83) in straitened circumstances owing to continued illness requiring expensive medical treatment. A grant to the widow of an associate member, who has three young children dependent upon her. Worthy of special mention also is the facility available to the Institution to nominate one of its beneficiaries to live in a residential home provided as a result of co-operation between the benevolent funds of certain chartered institutions and other professional bodies. The

Institution of Gas Engineers Benevolent Fund has invested £1,000 in this scheme, and its first nominee (the widow of a member for 24 years) took up residence at the first of these homes, Hurst Grange, West Worthing, early this year.

We hope we have said sufficient to stimulate further interest in this very worthy cause and perhaps encourage more of the new members of the Institution to subscribe. In this connection, we might draw particular attention to the advantages of signing a Deed of Covenant, whereby the Benevolent Fund is enabled to recover from the Inland Revenue, out of income tax already paid by the subscriber, a sum proportional to the amount of the annual subscription. The actual value of the subscription is thus greatly increased.

# Personal

**Mr. N. R. Junkison** has been appointed Deputy Divisional Manager, Headquarters Division, North Thames Gas Board; and **Mr. A. G. R. Farr,** Public Lighting Superintendent.

**Dr. John W. T. Walsh,** twice President of the Illuminating Engineering Society and known internationally for his work on photometry and in connection with the International Commission on Illumination has been awarded Honorary Membership of the Society.

## AREA GAS EXAMINERS

**Mr. G. A. Westbrook,** Mains Superintendent, Eastern Division, North Thames Gas Board, is the first winner of the Stephen Lacey Golfing Trophy (silver bowl). The Trophy was presented by the North Thames Gas Sports Association and 31 entrants competed for it on the recent first occasion.

The Minister of Fuel and Power has appointed Area Gas Examiners in respect of all gas board areas. They will be responsible for co-ordinating and supervising the official testing of gas by the Gas Examiners appointed under Section 55 of the Gas Act, 1948. The Officers are as follows:

Scottish.—G. Munro, 24/26, Douglas Crescent, Edinburgh 12 (Edinburgh 34881).

Northern.—J. McCabe, Government Buildings, Kenton Bar, Newcastle-on-Tyne, 3 (Newcastle 25121).

North Western.—E. L. Mills, Burton Road, West Didsbury, Manchester, 20 (Didsbury 5180).

North Eastern.—F. C. Lee, Century House, South Parade, Leeds, 1 (Leeds 30611).

East Midlands.—H. R. F. Hemmings, Block 7, Government Buildings, Chalfont Drive, Nottingham (Nottingham 77711).

West Midlands.—W. D. Cadwallader, 63, Hagley Road West, Birmingham, 17 (Bearwood 3071).

Wales.—A. S. Williams, 27, Newport Road, Cardiff (Cardiff 9234).

Eastern.—C. G. W. Kent, Block C., Government Buildings, Brooklands Avenue, Cambridge (Cambridge 54587).

North Thames.—F. L. Freeland, Mill House, Shaftesbury Avenue, London, W.1 (GERrard 9700).

South Eastern.—F. S. Shadbolt, Mill House, Shaftesbury Avenue, London, W.1 (GERrard 9700).

Southern.—R. W. Hendy, Whiteknights, Earley, Reading (Reading 61491).

South Western.—G. E. Cashmore, Flowers Hill, Brislington, Bristol (Bristol 75341).

# Obituary

**Mr. Harry Smith,** Chairman of the Coppee Co. (Great Britain), Ltd., died at his home at Birchington on May 5, aged 75. His many business interests included the Chairmanship of the Coal Preparation Plant Association, the Notts and Derby Coke and By-Products Co., Ltd., and of the Coke Oven Section of the Society of British Gas Industries. He was also a Director of the British Sulphate of Ammonia Federation.

# Diary

**May 17.—Gas Council Commercial Managers' Committee,** Leeds. 10.15 a.m.

**May 18.—London and Counties Coke Sales Circle:** Annual General Meeting Gas Industry House, 2.30 p.m. (Extraordinary General Meeting at 2.15 p.m.)

**May 18.—Institution of Chemical Engineers:** 29th Annual Corporate Meeting, May Fair Hotel, London, 11a.m.; Presidential Address, 12 noon; Annual Dinner, 7.30 p.m.

**May 19.—Scottish Junior Gas Association (Western District):** President's Day; Visit to Dumbarton gasworks.

**May 19.—Western Junior Gas Association:** Visit to the works of the Gloucester Aeroplane Co., Ltd., Gloucester.

**May 22.—Institution of Gas Engineers (London and Southern Section):** Spring General Meeting, Connaught Rooms, Kingsway, W.C.2. 2.30 p.m., Chairman's Address, T. C. Battersby. (Preceded by Luncheon, 12.30 p.m.).

**May 22.—Women's Gas Federation:** 16th Annual General Meeting, Caxton Hall, Westminster.

**May 23.—Gas Council: Industrial Gas Development Committee,** South Western Gas Board offices, Bath.

**May 23.—Yorkshire Junior Gas Association:** Visit to W. J. Jenkins and Co., Ltd., Retford, 12 noon. Paper by W. Morland Fox, Sales and Projects Director.

**May 26.—Eastern Junior Gas Association:** Annual General Meeting, King's Lynn.

**May 29-June 1.—Institution of Gas Engineers:** Annual General Meeting, London. (For detailed programme, see *Journal* of May 9, p. 361.)

**May 31.—North Thames Gas Consultative Council,** Westminster City Hall, Charing Cross Road, 2.30 p.m.

**June 5.—South Eastern Gas Consultative Council:** General Purposes Committee, Goring Hotel, Victoria, 2.30 p.m.

**June 7.—Midland Junior Gas Association:** Ladies' Day. Luncheon, Grand Hotel, Hanley, 12.30 p.m.

**June 9.—Scottish Junior Gas Association (Eastern District):** Annual Outing, Forfar.

**June 9.—Manchester District Junior Association of Gas Engineers:** 'The Economics of Gas Manufacture,' M. Redman (North Western Gas Board); Visit to the works of W. C. Holmes and Co., Ltd., Huddersfield.

**June 11.—West Midlands Gas Consultative Council:** Dudley Room, Queen's Hotel, Birmingham, 2.30 p.m.

**June 11.—Nalgo Conference:** Meeting of Gas Staffs, Blackpool, 9.30 a.m.

**June 11-12.—Institution of Gas Engineers (Eastern Section):** Annual Meeting, Royal Hotel, Lowestoft.

**June 15.—Institution of Gas Engineers (Midland Section):** Summer Meeting and Chairman's Day, Oxford.

**June 20.—Eastern Junior Gas Association:** Annual General Meeting, Globe Hotel, King's Lynn. 11.15 a.m. Afternoon coach tour to Sandringham Gardens and Hunstanton.

**The Proceedings** of the Chemical Engineering Group of the Society of Chemical Industry for 1949 (vol. 31) have been published in booklet form and are available from the offices of the Group, 56, Victoria Street, London, S.W.1, at 21s. per copy.

**Work is to Begin** at the earliest possible date on the new Scottish Agricultural Industries, Ltd., sulphuric acid plant at Aberdeen. Messrs. W. J. Anderson, Ltd., of Aberdeen, have been given the civil engineering contract on the new project. S.A.I. will erect here a modern plant for manufacture of 37,000 tons of 100% sulphuric acid annually, at a cost of £410,000. The plant will be among the most modern of its type in Great Britain and is part of the plans to enable the manufacture of fertilisers to proceed without dependence upon imported sulphur.

**The Engineering Conference** to be held jointly in London during June 4 to 15 by the Civils, Mechanicals, and Electricals promises to be a most comprehensive and authoritative event. The programme is formidable yet well balanced. Included among the papers is one by Mr. F. M. Birks, C.B.E., President of the Institution of Gas Engineers, and among the many visits planned is one to the Beckton works of the North Thames Gas Board. The Organising Committee of the three Institutions has fixed May 21 as the final date for the receipt of applications.

**With the Introduction of Gas** to many large new housing estates in the north-east, housewives are not always aware of how to get the maximum advantage from their cookers and other equipment. With this in mind the Northern Gas Board arranged a special demonstration for the first 400 of the 1,000 tenants who will ultimately live on a new estate at Chester-le-Street, Co. Durham. All types of gas appliances, including refrigerators, boilers, cookers, fires and other equipment, were on show, and a cooking demonstration was given by Miss D. McCall, the Board's Chief Home Service Adviser. The arrangements were made in conjunction with Chester-le-Street Rural District Council Housing Committee, whose chairman was introduced by Mr. S. C. Watson, Divisional Sales Manager.

**One of the Latest Names** in the visitors' book at the Wales Gas Board's head office in Cardiff is that of Bay Atif Benderlioglou, the Mayor of Ankara. He has come over to see the Festival of Britain, but one of his primary objects is to examine English local government, public services, and nationalised industries. While in Cardiff just before Whitsun he was entertained at lunch by the Chairman of the Wales Gas Board (Mr. T. Mervyn Jones). He was also conducted over the Grangetown works of the Cardiff undertaking, and the coke ovens and distribution system of Guest Keen, Baldwins Co., Ltd., who supply large quantities of coke oven gas to the Cardiff undertaking. As Mayor, he is directly responsible for Ankara's gas and all departments of administrative organisation in the Turkish capital, and he is strongly in favour of modelling Ankara on English lines.

# News in Brief

**Because the Heat-Storage Cookers** installed in council houses built at Market Rasen (Lincs.) by the Urban District Council are too expensive to run, gas cookers will in future be installed in all council houses in the town. Back-boilers will be fitted for domestic hot water.

**Inverkeithing Town Council** has decided to join other local authorities in appealing against the valuation placed on the gas undertaking in the borough. The Town Clerk said the assessor for public undertakings had given this year a gross annual value of £310. Before nationalisation the valuation was £676. Following nationalisation and a consequent change of method in valuing, there was a drop in the rates drawn. Last year nine boroughs appealed against the method of assessing gas undertakings, and were successful in their appeal before the Land Court, with the result that their values were increased to practically pre-nationalisation figures.

**Change of Address.**—As from May 16 the Newcastle-upon-Tyne district office of the British Thomson-Houston Co., Ltd., moved to more commodious premises at 9, Higham Place, Newcastle-upon-Tyne, 1. The telephone number remains the same, Newcastle 25040, as for the old offices at Ellison Buildings, Ellison Place.

**A Striking Brochure** has been published by the City of Johannesburg Gas Department, interestingly illustrated and full of informative facts and figures and historical notes on the progress of the undertaking from the formation of the original company in 1886. The first gas plant was brought from England and transported by ox wagon 700 miles from East London; supply was commenced in June, 1892. At that time the annual output was 11 mill. cu.ft. Today it is over 1,681 mill. cu.ft.

**The 31st Annual Report** of the British Non-Ferrous Metals Research Association is a well-produced publication in an unusual cover which attracts the eye. The year has been notable for the reoccupation of the Association's laboratory block which took place in February, 1950, and the new layout and additions have enabled the expanded programme to be accomplished more efficiently. Overall income was approximately £105,000 or about £2,500 more than the previous year. The membership of the Association at the end of 1950 was 495.

## GAS ENGINEERS' HALF HOLIDAY

MR. IVOR PREECE, Rugby International and late English Captain, who is assistant to Mr. Fred Wilson on the sales staff of George Wilson Gas Meters, Ltd., on April 18 took a team composed mainly of international and trial players to Abertillery for a game arranged in conjunction with Mr. D. S. Davies, Engineer and Manager of the Abertillery undertaking. The team included E. N. Hewitt, H. Walker, S. J. Adkins (Coventry and England), V. G. Roberts (Penryn, Swansea, and England), Ken Jones, D. Hayward, and Rees Stephens (Wales) and a number of county players.

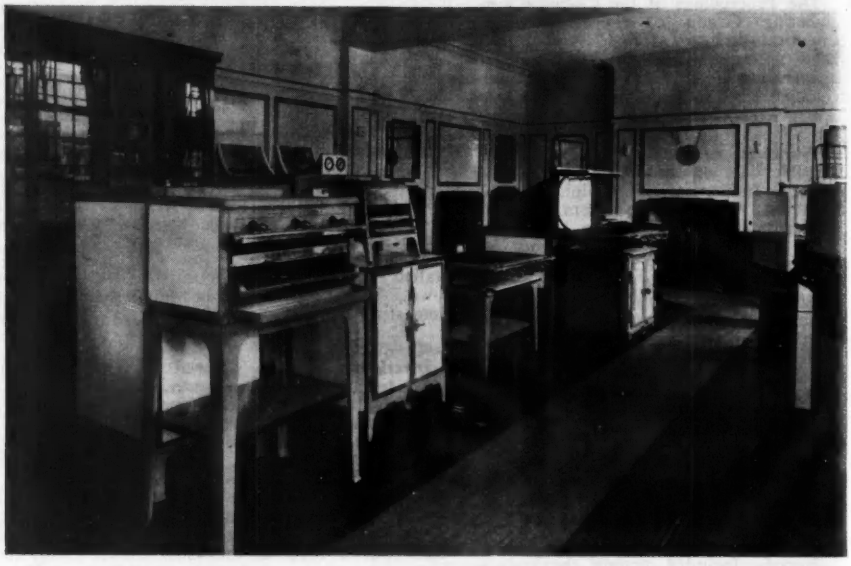
Preece's XV won the match by 11 points to 9. Many representatives of the gas industry were present at the match and at a dinner which followed, and the gathering included the Chairman of the Abertillery Urban District Council who, prior to nationalisation, was Chairman of the Gas Committee.

A similar match was played at Cheltenham on April 25, when Preece's side beat the local club by 16 points to 8.

South Wales Argus photo.

*After the Abertillery match: Left to right: D. T. Phillips (Aberdare), D. I. Rowlands (Caerphilly), Trevor A. Morgan (Chief Accountant, Wales Gas Board), Ivor Preece, W. F. Edwards (Port Talbot), J. Powdrill (Pontypool), and D. S. Davies (Abertillery).*

# SUCCESSFUL LARGE SCALE CATERING EXHIBITION AT ABERYSTWYTH



CONSIDERABLE interest has been aroused by the display of catering equipment at the Showrooms of the Aberystwyth undertaking of the Wales Gas Board.

The showroom was set out with large scale equipment supplied by Radiation Ltd. and James Stott & Co. (Engineers), Ltd. The key-note of the Exhibition was simplicity and cleanliness, the latter being emphasised by the finish of the equipment. The simple lines and clean appearance of the equipment left no doubt as to the contribution that can be made by the gas industry in fulfilling the recommendations of the report of the catering trade working party.

The equipment on view included a 'Confector' pastry oven, 'Keswick' steamer, 'Chester' single-oven range, 'Savoy' griller, 'Kingfisher' fish fryer, 'White Lady' hotcloset and 'Chester' boiling table, Stott hotcloset, together with a most comprehensive range of Stott boiling water units, café sets, milk, coffee, and bulk urns. To interest the housewife a range of modern domestic appliances was also on view.

Invitations were sent to all the hoteliers and restaurant proprietors in the town, and the attendance has been good and many enquiries resulted.

# Midland Juniors' Annual Meeting

## SERIOUS FINANCIAL LOSS DUE TO UNPAID SUBSCRIPTIONS

THE annual general meeting of the Midland Junior Gas Association was held in Birmingham on May 1, the President, Mr. J. Palser, occupying the chair.

At the outset he made reference to the death of Mr. E. B. Tomlinson, formerly Chief Engineer of the Birmingham Gas Department.

On the presentation of the annual report and accounts, the President said it had probably come as a shock to most of them to realise that 180 members out of a total of 450 had not paid their subscriptions, and they had had a serious financial loss on the year.

He congratulated Mr. J. F. Waight and Mr. B. H. Cunningworth on having had papers accepted to be read at the forthcoming meeting of the Institution. He also congratulated Mr. E. Arthur on having won the Silver Medal of the S.B.G.I. for his paper given last session on 'The Design, Construction, and Erection of Tower Purifiers.'

It was announced that Mr. J. A. Tomes had been elected Junior Vice-President.

Mr. S. Brockbank said they had had a bad year financially, with a deficit of £86 which was bigger than the previous year. He emphasised the burden of the rising costs of 'Transactions.'

Mr. F. A. C. Pykett said some members did not take the interest in "Transactions' which they should do, and he thought the present arrangement should be dropped.

Another member said the 'Transactions' were of great value to students, and he thought some modified plan might be made for reproduction of the more important papers.

A number of alterations in rules were made. It was agreed that those eligible for membership shall

(a) be engaged on the technical staff staff of a Gas Undertaking or a Coke Oven works or any works dealing with the working up of residual products or otherwise associated with gas manufacture and distribution, or the manufacture, but not the sale, of plant and appliances used in the gas industry, and

(b) hold an examination certificate of the Institution of Gas Engineers or the City and Guilds of London Institute in Gas Technology, or other qualifications approved by the Council, or be engaged upon a course of study leading to an approved qualification

or

(c) hold a recognised official position considered by the Council to be of appropriate seniority on the staff of a gas undertaking.

It was also agreed that each member should be entitled to purchase a copy of the Junior Gas Association's Joint Proceedings at a nominal price as assessed by the Council each year.

Mr. A. E. Hart said the organisation of the industry included plant and appliance manufacturers, who should be included. As it was the Association seemed to be closing its ranks when it was desirable that it should have all the knowledge and experience available.

The Chairman said he thought there was a misunderstanding. The rule was intended to cover manufacture of gas apparatus, but not sale.

Officers re-elected were: — *Hon. Treasurer:* Mr. A. Brockbank. *Hon. Auditor:* Mr. B. I. Shaw; and *Hon. Secretary:* Mr. H. J. Reynolds, to whose work a special tribute was paid.

Mr. E. T. Pickering presented the Educational Representatives' report, and Messrs. W. Macnaughton, F. L. Atkin, W. H. Clarke, and Mr. F. Richmond (Leicester) were elected to the Committee with Mr. Pickering to serve *ex officio* as Secretary.

Mr. E. J. Perks, Midland Manager, Ascot Gas Water Heaters, Ltd., then gave an informal talk on 'Recent Experiences in the U.S.A. and Canada.'

# Juniors at Skefko Works

A PARTY of approximately 50 members of the Eastern and Midland Junior Gas Associations visited the Luton and Sundon factories of the Skefko Ball Bearing Co., Ltd., on April 18, accompanied by Mr. J. Palser (President of the Midland Association) and Mr. A. D. Duxbury (Assistant Secretary of the Eastern Association).

The party were received by Mr. G. Burnside, Assistant Works Manager, and were accompanied round the works by Mr. Burnside, Mr. H. Mitchell (Welfare Officer), Messrs. Pope and Holland (Technical Department) and Mr. T.E.W. Harding (Personnel Department).

As Skefko is the only concern in Britain which manufactures all four types of ball and roller bearings (ball, cylindrical roller, taper roller, and spherical roller) the visitors obtained an unusually comprehensive picture of the major processes involved in the industry.

The party began their tour in the Luton works, breaking off for lunch in the canteen. Later in the afternoon they were shown over the plant at Sundon, some three miles away.

The chief raw materials used in the manufacture of bearings are bars, tubes, billets, and wire. The small and medium rings are formed in multi-spindle automatics. Large rings are turned from tube in single-spindle automatics. Large rings are turned from tube in single-spindle automatics. Machining not suited to the automatics is done on light, quick-acting capstan lathes.

Hardening of the rings is then carried out in special gas fired furnaces at temperatures ranging from 740°C. to 860°C. according to the size and shape of the part, after which the flat surfaces, the outer diameter, and the bore are ground to exceedingly accurate dimensions.

Except for the larger sizes, steel balls are cold headed from wire and then rough-ground to remove the fin formed in pressing to shape. They are then hardenel in gas fired furnaces and pass to the precision grinding machines from which they emerge as true spheres of the exact size required. The characteristic high polish of steel balls is obtained by tumbling them with leather cuttings in wooden tumbling barrels.

Rollers are manufactured on similar lines except that the diameters are ground in centreless grinding machines and the ends in specially designed end-grinding machines. Grading of both balls and rollers involves a thorough individual scrutiny for detection of external blemishes and mechanical inspection for roundness and size.

Various types of cage are used to hold the rolling elements in place, and the whole of the assembly operation is carried out in specially constructed dust-free shops. Absolute cleanliness is essential in the production and assembly of a high-precision article such as a bearing.

At every stage in manufacture the various component parts are subjected to rigid tests for accuracy, some 60 or 70 checking operations being involved on every bearing. Nevertheless, each bearing has to pass a searching final inspection, including a running test, before being greased and packed.

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**Twenty-one Local Authorities** in the north-east at a meeting at Newcastle-on-Tyne decided to repeat their application for the Northern Gas Board to receive a deputation to discuss a new scale of gas charges. The Board recently turned down the local council's first application to receive a deputation on the grounds that it was a matter to be discussed between the councils and the Gas Consultative Council.

# NEW GASWORKS FOR PENZANCE

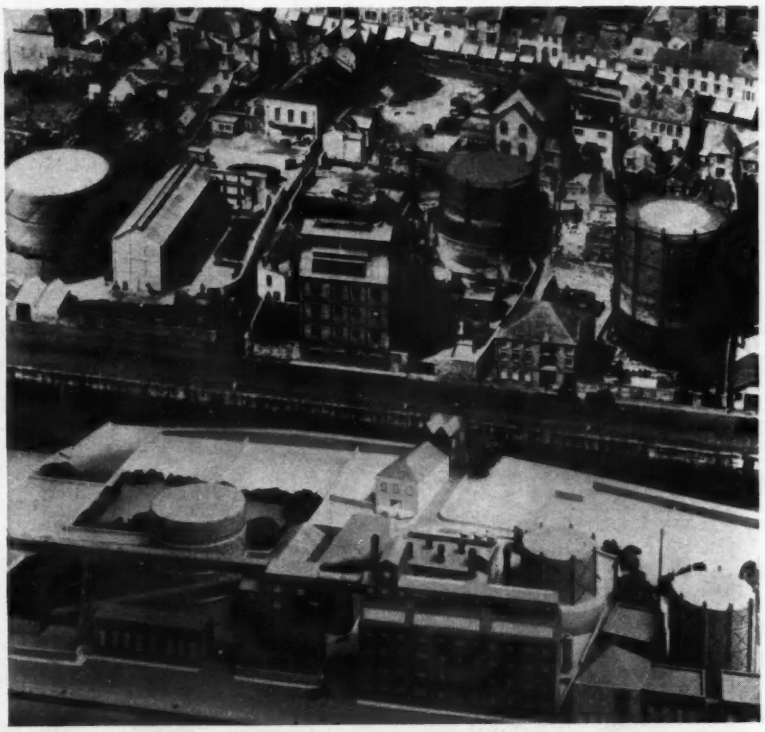
THE gas produced for the South Cornwall sub-division is supplied from eighteen different works, most of which are of small capacity and uneconomical for future operation. The South Western Gas Board has therefore decided to concentrate gasmaking plant at three stations—namely, Penzance, Truro, and Newquay—to supply the whole of the sub-division.

The existing Woodall-Duckham carbonising plant of 12 44-in. continuous vertical retorts will be extended to an ultimate installation of 30 similar retorts which will be capable of producing 2,250,000 cu.ft. per day as compared with 812,000 cu.ft. at present. New and improved coal and coke handling equipment and suitable ancillary plant of modern design will be provided.

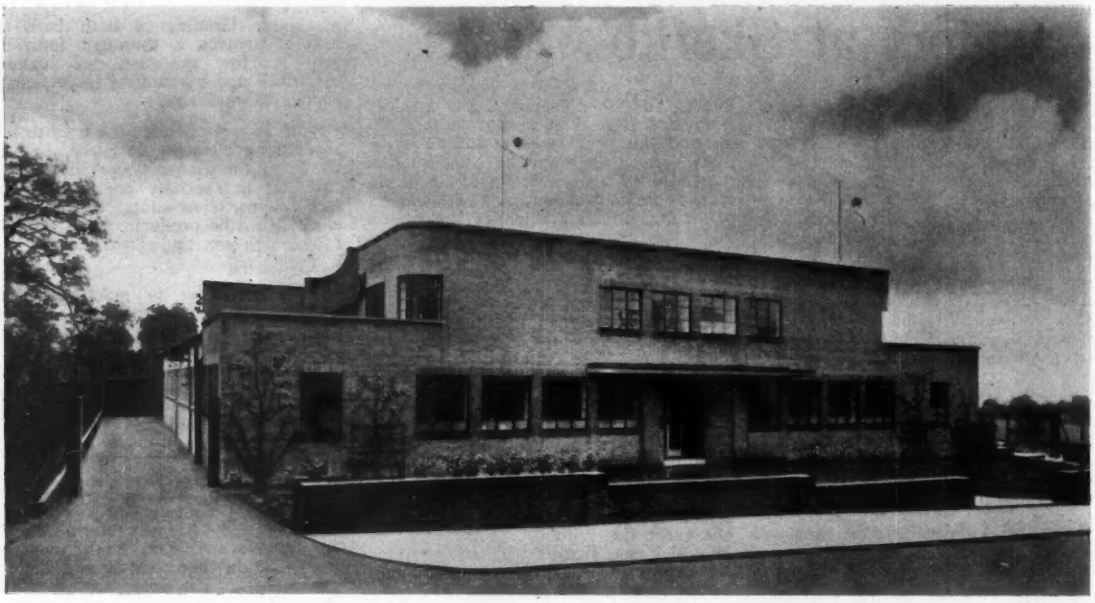
In addition, carburetted water gas plant will be installed which will have an effective capacity of 2 mill. cu.ft. per day. In total, therefore, the output from this works will be 4¼ mill. cu.ft. of gas per day.

The existing works area of 1.58 acres is to be extended to 2.53 acres by the purchase of additional land, but even so it has presented a difficult problem to the Board's engineers due to variation in levels of more than 30 ft. over the site.

At present coal is delivered by sea to Newlyn harbour and is transferred to the works, some 1½ miles distant, by road haulage. It is intended in the future to offload at Penzance harbour, which, being immediately adjacent to the works, will reduce freight charges.



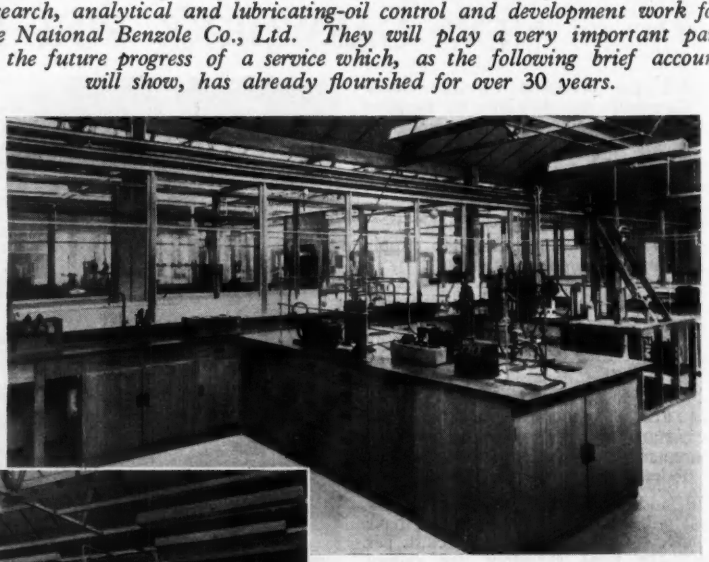
*In order to overcome the problems presented by a very limited site with many varying levels, the plant has had to be concentrated, and the accompanying aerial photograph of the present works alongside a scale model of the new works (prepared at the Southern Divisional Headquarters) illustrates the general layout.*

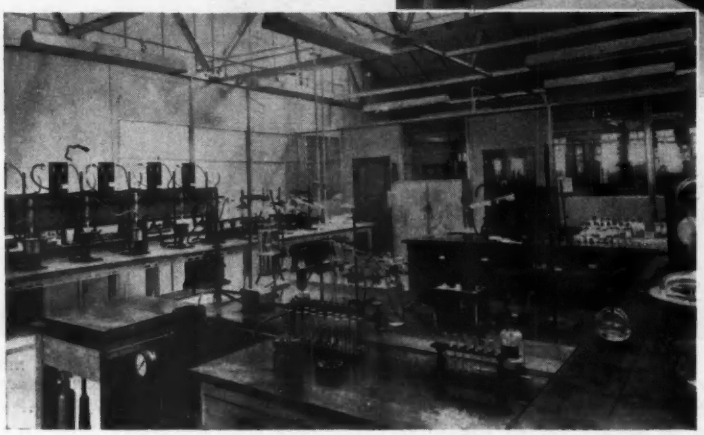


# BENZOLE RESEARCH LABORATORIES

*The laboratories opened at Otterspool Way, Watford, centralise the research work carried out for the National Benzole Association, as well as the research, analytical and lubricating-oil control and development work for the National Benzole Co., Ltd. They will play a very important part in the future progress of a service which, as the following brief account will show, has already flourished for over 30 years.*

BENZOLE was discovered in 1825 by Faraday, but it was not until Perkin's synthesis of mauve in 1856 and the subsequent foundation—at Greenford, only about nine miles from these premises—of the synthetic dye industry that it was first put to a commercial use. The quantities required, however, were comparatively small, and nearly another 60 years elapsed before the demand for toluene in the first World War made it necessary for nearly all coke ovens and many gasworks to commence the recovery of benzole. Output rose rapidly, and in 1918 reached 26.4 mill. gallons, but it soon dropped after the war when most gasworks ceased production for the want of a suitable market. Some of the more progressive manufacturers, however, realising that benzole was a considerable potential source of revenue, decided in 1919 to form the National Benzole Association, to examine the possibilities of finding peace-time uses for benzole. Its eminent suitability as a motor fuel was soon established, and





**Above:** *Physical Laboratory.*
**Left:** *Petrol-Benzole Laboratory.*

in order to market benzole in this particular field, the National Benzole Company, Ltd., was created later in the same year.

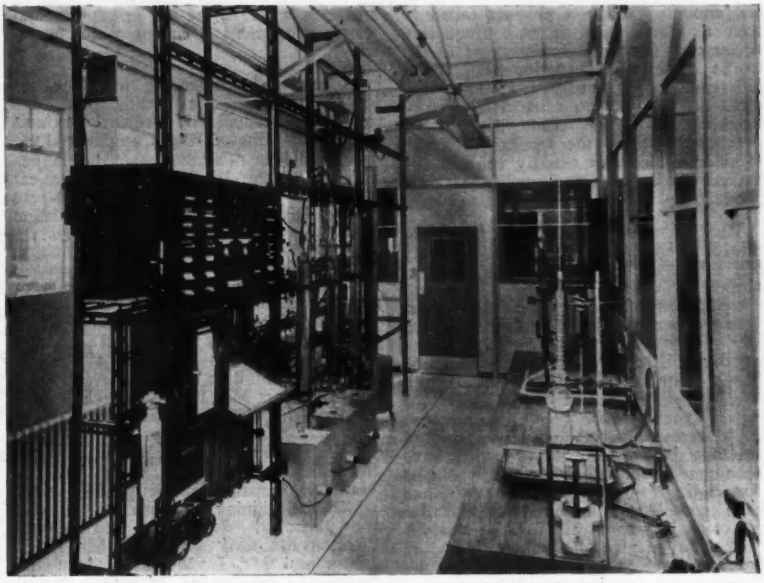
In 1921, realising that progress could not be made without proper technical and scientific investigation, the Association formed a Joint Benzole Research Committee, consisting of an equal number of representatives of the National Benzole Association and of the Univer-

sity of Leeds, with Mr. S. Henshaw as Chairman and Professor J. W. Cobb as Hon. Secretary. Its first meeting was held in October, 1921, so that this Committee was one of the earliest co-operative research organisations to be established in Great Britain. Mr. E. C. Williams was appointed Research Chemist but two years later resigned. His place was taken by Mr. W. H. Hoffert, shortly to be joined by Mr. G. Claxton as assistant.

The laboratory work was carried out by this small team on two benches in a corner of the main laboratory of the Fuel Department of the University of Leeds. This remained their home until 1930.

Meanwhile the National Benzole Company, having started to market a benzole-petrol mixture in 1922, had established a small control laboratory at its Head Office in Wellington House, S.W.1, under the leadership of Mr. W. H. Coleman. In 1930 it was decided to accommodate both the Company's analytical control and the Association's research staff together in new premises at Willesden. At the same time the Joint Research Committee was disbanded and the Association set up a representative Research Committee, which still controls the co-operative research activities of the industry. Five years later the technical activities of both Association and Company were brought under one administration, nominally run by the Company. Mr. W. H. Hoffert was appointed Chief Chemist and remained in this position until his death in August, 1949. The advantages of the integration have been many, and of equal benefit to producer and selling organisation.

Closer contact with the works production side of benzole came after the inhibitor process, patented by the Association in 1925, was brought into use.

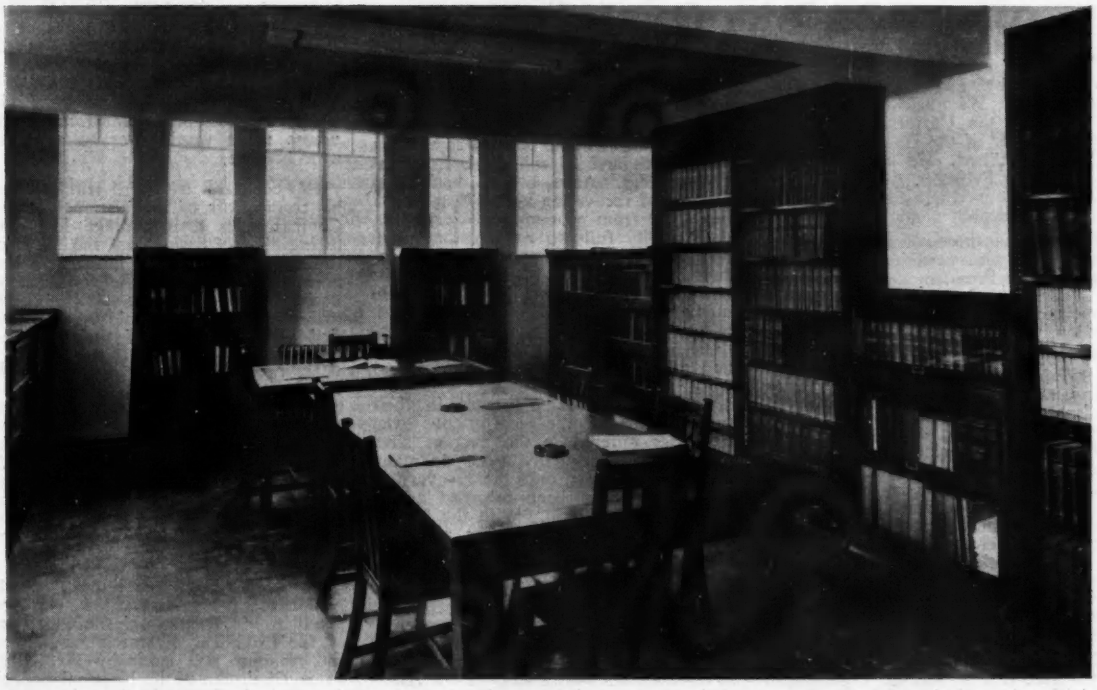


*Fractionation Laboratory.*

This process, which necessitated a change in the specification for motor benzole, enabled many benzoles to be refined in a condition satisfactory for use as a fuel in a petrol-benzole blend, without the destructive use of strong sulphuric acid. At first there was considerable commercial doubt as to the effectiveness of the process, but after its success had been demonstrated by a series of trials in storage and in cars on the road it was readily accepted by the industry and has resulted in an annual saving of about 2 mill. gal. of benzole, worth between £100,000 and £150,000.

It was realised that the establishment of a new type of refining process on the works needed technical supervision. Free licences were granted to all members who applied, and after a sample of the crude benzole had been examined, suggestions were offered by the technical department as to the best method of treatment.

Following these contacts with makers there arose a new attitude towards the analytical control of quality, and it was seen that a simple prohibitive control was



*The Library.*

not enough. When a product failed to pass a specification it was frequently because of unusual circumstances in the works. The wide experience of many different crude benzoles enabled the technical department, after a laboratory examination of the crude benzole, or perhaps a visit to the works concerned, to offer advice that usually enabled the makers to improve the quality of their product up to the standard required.

The technical department has continued its research into a wide variety of subjects, ranging from benzole-absorption oil problems to a technical investigation of the possibilities of marketing a benzole-alcohol-petrol fuel, and the results of these researches were usually made available to members. Papers of more general interest are published in the technical Press. In the earlier years reports of the research work were published annually in bound volumes, but latterly these reports have been made available to members of the Association as each investigation has been completed. In addition, the department is responsible for the analytical control of all the products, including benzole-petrol mixtures, sold by the Company. An intensified programme of work on lubricating oil will be part of the department's activities in its new premises.

### The New Laboratories

The laboratories built at Willesden in 1930 became inadequate as the technical service of the Company and of the Association increased. Two more small laboratories and additional office accommodation were provided on the same site, but it was evident that, if further progress were to be made, larger and more convenient premises were necessary.

A search, commencing in 1939, resulted in the present building which was originally occupied by Bedford Products and Light Engineering Company, Ltd., one of whose activities was the manufacture of the Eta range of chemical balances. The premises, on a 3¼-acre site, consisted of a single-storey machine shop, approximately 90 ft. x 85 ft., fronted by a two-storey block.

The original plans for conversion were the work of the technical department and the Chief Chemist, Mr. G. Claxton. Draft plans were submitted to and approved by a sub-committee of the Research Committee, consisting of Mr. H. H. Bates, Mr. F. G. Broughall, and Dr. W. Idris Jones. Estimates of the cost of converting were prepared by Mr. A. W. Higson and Mr. R. C. Lewis of the Engineering Department of the National Benzole Company, Ltd., who, while maintaining a close liaison with the technical department throughout, directed the work involved. Mr. R. C. Lewis and Mr. L. W. Barnard of the technical department deserve special mention in this connection.

The design of the new laboratories is simple and compact. A central corridor divides the one-storey building into two sections, one devoted to research and the other to control. Cross-corridors provide access to the various laboratories as well as adequate fire escapes. Each section has a centrally placed balance-room, which also serves as a writing-room. A pleasant canteen and a well-equipped kitchen are also provided.

An important part of the new premises is the library, which at present contains about 1,000 volumes, as well as the more important technical journals.

Adjacent to the main building is a smaller one, approximately 22 ft. x 60 ft. devoted to engine-testing and workshops, where much of the apparatus needed for the laboratories can be made or maintained. After consideration of many alternatives, the laboratories were laid with magnesite floors, since these are durable, resistant to chemicals, and reasonable in price. A light colour was chosen to increase illumination and enforce cleanliness. Office floors are in Semtex. Holoplast partitions have been used and the roof has been lined with insulating board to reduce heat losses.

As far as possible services run overhead and drop down to convenient connection points on the benches. Drains are earthenware and run to a single interceptor outside the building. All drains can, if necessary, be rodded through.

Considerable thought has been given to decoration, and for this light and attractive colours have been chosen. Paints resistant to hyrogen sulphide have been used in the laboratories.

Fronting the laboratory block is a two-storey administrative building, housing the Chief Chemist, the Assistant Chief Chemist, and the necessary administrative and clerical staff. The total staff, including chemists, canteen members, and labourers, numbers 45.

The laboratory fittings were by A. Gallenkamp & Co., Ltd.

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# Close Link with Gas Industry

THE opening ceremony was performed by Sir Robert Robinson, O.M., F.R.S., Waynflete Professor of Chemistry at the University of Oxford, and a member of the Gas Council's Research Committee. He was introduced by Sir Edgar Sylvester, C.B.E., Chairman of the Gas Council and Chairman of the Council's Research Committee.

Following inspection of the laboratories those who participated were the guests of the President and members of the Executive of the National Benzole Association at lunch at the Savoy Hotel, London, when Sir Edgar Sylvester, President of the Association was in the chair.

Sir Edgar, proposing the toast of the guests, said that the membership of the National Benzole Association in 1919, when Sir David Milne-Watson was elected the first President, was 87, comprising 61 coke oven producers and 26 gas undertakings, and by 1949 it had increased to 316, of which 249 were gas undertakings. The membership position today was different, because as a result of nationalisation the National Coal Board counted as one member on behalf of its individual units, while the membership of gas undertakings was now through the 12 area boards.

The strength of the Association lay in the fact that it was an organisation comprising the majority of the producers of benzole, including the owners of coke ovens and gasworks, together with the refiners who handled crude material from either or both sources. In 1950, 66 mill. gal. of crude benzole came from coke ovens and 26 mill. gal. from gas undertakings. Area boards had plant capable of recovering about 40 mill. gal. but apart from economic considerations, their ability fully to employ that plant was dependent both on their total capacity of carbonising plant and on the adequacy of their supplies of coal. In many works area boards had found it necessary from time to time to discontinue benzole recovery in order to maintain an adequate supply of gas.

Apart from the difference in their primary purpose, the gas and coke oven industries differed in the average sizes of the plants normally used. In many of the smaller gasworks the recovery of benzole had not been regarded as an economic proposition. With the formation of area boards, however, and with the tendency towards larger manufacturing units, the recovery of benzole, subject to the considerations he had mentioned, was likely to be more practicable.

The new premises opened that day would provide excellent accommodation to enable the research work of the Association to be carried on under the supervision of the Chief Chemist, Mr. Claxton, who was appointed assistant research chemist in 1924; and at that point he would like to pay tribute to the work of his predecessor, Mr. W. H. Hoffert, whose untimely death in 1949 terminated the brilliant career of one whose name would ever be associated with benzole.

He congratulated Mr. Hittinger and his co-directors of the National Benzole Company on their courage in undertaking this extension on the technical side at a time when it must have been unusually difficult for the work to proceed. The engineering staff and the various contractors should be well satisfied with the result of their efforts.

Their chief guest, Sir Robert Robinson, had contributed more than most to the progress of organic chemistry and had attained the highest honours open to a scientist. Other guests included chairmen or directors of research of the Gas Research Board, Fuel Research Station, Coal Tar Research Association, British Coke Research Association and the British Coal Utilisation Research Association.

The remaining toast—that of the National Benzole Association—was proposed by Mr. R. B. Robinson, Chairman of the Coal Tar Research Association, and response was made by Mr. H. H. Bates, Chairman of the National Benzole Association's Research Committee.

# AMERICAN SPOTLIGHT

## *Items of Topical Interest from the Contemporary Technical Press of Canada and the United States*

### *OBJECTIONS TO GAS LIGHTING*

NEW Englanders in the last century devoted much serious thought to thinking up objections to the growth of gas lighting.

Some objections culled from a New England newspaper of the period were brought to light in a historical brochure prepared by the Harrisburg (Pa.) Gas Co. to celebrate its 100th anniversary.

The arguments against gas light as quoted include:

1. A theological objection. Artificial illumination is an attempt to interfere with the divine plan of the world which had preordained that it should be dark during the night time.
2. A medical objection. Emanations of illuminating gas are injurious. Lighted streets will incline people to remain late out of doors, thus leading to increase of ailments by colds.
3. A moral objection. The fear of darkness will vanish, and drunkenness and depravity increase.
4. Police objection. Horses will be frightened and thieves emboldened.
5. Objections from the people. If streets are illuminated every night, such constant illumination will rob festive occasions of their charm. (*Gas Age.*)

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### *ANTI-STRIKE LAW INVALID*

THE American Supreme Court, on February 26, struck down a Wisconsin law which banned strikes by public utility workers and required them to submit labour disputes to compulsory arbitration.

The ruling was on an appeal by a transportation workers' union which contended the Wisconsin law conflicts with rights given workers by the National Labour Relations Act and violates the Constitution by imposing involuntary servitude and by invading rights of free speech, public assemblage and freedom to contract.

Justice Vinson said the Wisconsin anti-strike law conflicts with the National Labour Relations Act, and therefore cannot stand. (*American Gas Journal.*)

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### *PROPANE GAS FOR VANCOUVER*

NORGATE Park, Vancouver, B.C., is the first residential sub-division on the Lower Mainland to be served by propane gas. Since being installed at the end of the year, the propane air plant has been serving only Norgate Park, but it is so designed that its capacity can be increased to a point where it can be used to supply the whole of North Vancouver. This would entail little more than the addition of more propane storage tanks.

Plants of this type have been used for several years in various parts of Canada and the United States. For the last couple of years a similar one has supplemented the gas supply in Victoria. But Norgate's plant is the first of its type to be added to the Lower Mainland distribution system.

The decision to install the plant was made last summer, when it became evident that the increasing demand for gas in North Vancouver, particularly in the new Norgate Park sub-division, was overloading the existing system. The propane is stored in two 25,000-gal. tanks. (*Canadian Gas Journal.*)

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### *FINE SAFETY RECORD*

A TOTAL of 2,263,561 consecutive man-hours without a disabling accident is the record set by the fitting department of the Consolidated Gas Electric Light and Power Co., of Baltimore, between June 25, 1948, and August 6, 1950. This unusual record was honoured recently by the American Gas Association through a presentation of its Safety Merit Award Certificate to the company. (*Gas Age.*)

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### *WOODEN GAS PIPE*

WHILE doing some main repair work on the Market Square in London, Ontario, recently, Oliver B. Howson, foreman of the City Gas Company of London, uncovered a wooden tamarack pipe. The pipe was of the bell and spigot type and was in excellent condition. It is believed to have been in use since 1864. Mr. W. L. Duffield, president and general manager of the company, presented the wooden gas pipe to the University of Western Ontario to be placed in the museum. (*Canadian Gas Journal.*)

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### *COAL BY PIPELINE*

URGING the Ohio State Legislative Committee to approve a bill to give coal pipelines certain rights already enjoyed by gas and oil pipelines, James Hyslop, vice-president in charge of operations for the Hanna Coal Co., said transportation cost on coal per mile per unit of fuel value is now ten times as great as for oil and gas. In other words, to transport fuel equivalent in value to a ton of coal in the form of gas or oil through a pipeline costs about 26 cents per 100 miles. To transport a ton of coal the same distance costs $2.75.

By mixing coal with water and forming slurry, said Mr. Hyslop, research had shown that coal also could be transported by pipeline—and his company planned a full-size demonstration to pump such slurry 3½ miles through a 12 in. line from its Georgetown mine. (*Gas Age.*)

### *NATIONAL ADVERTISING*

DESPITE defence-economy uncertainties, many gas companies and their allied dealers are completing plans for active sales campaigns to offset electric competition and to assure themselves of a larger share of business in the face of rising taxes and increasingly restricted credit limitations.

The A.G.A. national advertising programme for 1951 calls for a total expenditure of $825,000, an increase of $44,000 over the previous year, and one of the largest budgets in 15 years of this activity. (*Gas Age.*)

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### *SUBMARINE PIPELINE*

THE first gas line to be constructed out into the Gulf of Mexico was completed in December by the Marine Gathering Co., of Houston, with a 50 mill. cu.ft. daily capacity. This pioneer submarine project is 8⅝ in. o.d., 8.44 miles long, and runs from Vermillion parish, Louisiana, out to the Pure Oil Co. drilling platform in what is known as the Rollover field.

The new underwater line is the first attempt to tap what is believed to be a vast gas field lying off shore from the coasts of Texas and Louisiana. The wells of the Pure Oil Co. drilled from the Rollover platform have ben capped for more than two years because no one had undertaken to build a transmission line. (*Gas Age.*)

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### *ALBERTA GAS STRIKES*

ALMOST every day comes news of fresh strikes of natural gas in Alberta (reports the *Canadian Gas Journal* of March 1). The third success in one week came to one prospecting company on February 22, with a volume estimated at 10 mill. cu.ft. a day. Two other companies obtained encouraging flows during the same week. Another has made its seventh strike in the south-eastern part of the province.

Some anxiety is felt at the decision of the provincial government not to permit the export of natural gas from Alberta at the present time. Warning was sounded by Dr. T. A. Link, prominent Western geologist and oil authority, that if Eastern Canada fails to show a greater interest in development of natural gas reserves of the western plains, the East may find itself out in the cold as and when the Alberta Government permits the export of gas from the province. In an address to a joint meeting of the Prospectors' and Developers' Association and the Geological Association of Canada, Dr. Link expressed the opinion that unless some organised effort is made to stimulate interest in this part of the country all the gas would be moving into the United States or Western Canada.

# Wales Staff Conference at Aberystwyth

## Preparing for Second Annual Report

THE fifth conference of chairmen and convenors of the Wales Gas Board was held at Aberystwyth on April 20, 21, and 22. There were present all members of the Board, who had been holding their monthly meeting in Aberystwyth on the previous days, chief officials from the Board's headquarters, and the chairmen, convenors, and group accountants of each of the 18 groups.

On this occasion, the Board also invited a few representative managers of undertakings who, not being either chairmen or convenors, do not normally attend. These included Mr. Darrell Rees, M.B.E. (Pembroke), Mr. C. L. Singleton (Chepstow), Mr. H. J. Stanley (Penmaenmawr), Mr. H. Evans (Newtown), and Mr. W. N. Thomas (Pwllheli). They were joined as guests by Mr. C. G. Reeve, Assistant Gas Engineer, and Mr. K. L. Kliest, Senior Chemist (South Wales).

The business sessions followed the usual lines. Each chief officer submitted his paper, which also serves as the circular describing Board policy, on matters for which he and his department are responsible, and the conference considered and discussed in detail its contents. The Wales policy is that only after such detailed consideration, including questions and comments by managers, does the circular take effect and become part of the instructions and advice of the Board to its managers. The conference will be followed by similar group conferences organised by each of the 18 group committees so that every manager has the opportunity of questioning and indeed criticising Board policy before it takes effect. Questions and comments were not lacking and the standard of discussion on gas industry policy was higher than ever.

### Accountancy

Mr. Trevor A. Morgan, Chief Accountant, submitted a paper on accountancy, opening with instructions on the production of accounts for 1950-51. It also dealt with revised arrangements for the submission of statistics to the Board, and with statistical information which should be produced and used for the interpretation of the periodical accounts.

Mr. W. R. Branson, Planning Engineer, spoke on 'Potential Sales Development,' and said that of the 680,000 houses in Wales, some 136,000 are in industrial areas to which it is unlikely to be economical to extend supplies of manufactured gas. Of the remaining 544,000, 386,000 were supplied with gas in December, 1949. The majority of houses not supplied are in the mining valleys of South Wales and Monmouthshire. If the average consumption per domestic consumer were increased to the best now being achieved by any undertaking in Wales and 90% of the 544,000 houses were supplied, sales would be increased by over 100%. Allowing for estimated increases of industrial and commercial sales, total output would be doubled.

Mr. C. B. Mawer, Secretary, stated in his paper that the Board was satisfied to date with the results achieved from the administrative system which had been set up. He stressed the importance of group committees paying increasing attention to the financial and commercial side of undertakings. Among other subjects dealt with were those concerning managers' monthly reports and the management of undertakings.

In his paper on 'Engineering and Working Results,' Mr. S. L. Wright, Gas Engineer, stated that the monthly summary of working results would in future be based on the figures submitted weekly by each undertaking to the Gas Council. Duplication of returns by undertakings would thus be avoided and the preparation of the monthly summaries accelerated. In future a summary of the quarterly results of each undertaking would be prepared, which would give more detailed information as to the operation of the undertakings than had been possible in the monthly summaries.

He also dealt with the subject of safety precautions, referring the conference to the issue to all undertakings of bound volumes of the safety recommendations of the Institution of Gas Engineers and drew attention to the manner in which these recommendations should be implemented.

*A few of those who attended the Aberystwyth conference. Left to right: S. L. Wright (Gas Engineer), C. G. Reeve (Assistant Gas Engineer), K. E. Tiddy (Carmarthen, Secretary of the Wales and Monmouthshire Section of the Institution of Gas Engineers), Gordon R. Davies (personal assistant to Mr. T. Mervyn Jones, Chairman of the Wales Gas Board), K. L. Kliest (Senior Chemist, South Wales), and S. L. Filer (Tredegar).*

The Deputy Chairman of the Board, Mr. R. S. Snelling, J.P., was invited by the Chairman to make a statement on 'Management.' The Chairman stated that no one was more qualified than Mr. Snelling with his long and distinguished experience in the gas industry (he had formerly been General Manager of the Severn Valley Gas Corporation, Gas Consolidation, Ltd., and the Newport Gas Company) to talk on such a topic.

Mr. Snelling's short but admirable statement was one of the highlights of the conference, whose appreciation was aptly expressed by one of the senior members, Mr. W. Clark Jackson (Coal Officer and Chairman of the Pembrokeshire Group Committee) who stated that he found in it a model statement of the aims and objects of a model manager.

Mr. W. T. Hird, Distribution Engineer, dealt with the progress of the installation of new gas supplies in new and existing houses and with various aspects of the preparation of schemes and estimates for this work. A proposed form of general conditions of contract and a standard specification for mainlaying was issued for comment.

Mr. W. H. Tarn, Industrial Gas Engineer, stressed the relationship of demand to the availability when considering new business, and it was also pointed out that the survey of potential business so far carried out showed that considerable developments will take place. The need for efficient application of gas to

all process work and the maintenance thereof was again stressed as this was a matter of importance on account of rising prices and the general fuel position. Attention was drawn to the rapid increase in the use of gas in the baking trade with the new 'Reel' type ovens. Mr. Tarn also referred to the report of the Catering Trade Working Party on 'Hygiene in Catering Establishments,' and the developments which these recommendations present to the gas industry.

### Coal Stocks Position

Mr. W. Clark Jackson, Coal Officer, dealt with the coal stocks position, the stock target aim, and group global stocks. He drew attention to the effect of colliery holidays on coal deliveries and suggestions were submitted as to the procedure to be adopted for the correct stocking of coal. He also told the conference that managers would shortly be acquainted with the test results obtained at the Grangetown works testing plant and the coals as used by them. These results would provide a form of yardstick and constitute a standard to be aimed at.

Mr. T. O. Jones and Mr. D. H. Griffiths, solicitors to the Board, submitted a paper dealing with the Public Utilities Street Works Act, 1950, and made special reference to the arrangements made with local authorities and other public utilities for the serving of notices at the local offices of the Board throughout Wales. A working guide to the Act had been prepared and circulated to all engineers and managers throughout Wales.

Attention was drawn to the case of George Wimpey & Co., Ltd. (1951, I.A.E.R., 363), relating to the practice of drivers of undertaking vehicles giving unauthorised lifts to strangers and the possible consequences thereof. Attention was drawn to the importance of forwarding a full report of any accident causing injury to persons or property to the appropriate insurance company and to the Industrial Relations Officer of the Board.

The procedure to be followed when a redeclaration of calorific value is made was set out for the guidance of undertakings.

### Industrial Relations

The paper by Mr. W. E. Crowley, Industrial Relations Officer, dealt with the classification of undertakings under Staff Intermediate and Joint Industrial Council Agreements, rates of pay, changes in conditions of service and arrangements for the setting up of joint consultative committees. Various items under training and education were reviewed, including gas fitters' classification schemes, the acceptance by the Chartered Institute of Secretaries of Board's pupils and the amendment of the syllabus of the Institution of Municipal Treasurers and Accountants (Incorporated) to make its final examination appropriate for students in the employ of the Board. In the arrangements for gas fitting classes at Newtown, the Board had further extended the facilities available in rural areas. Gas salesmen were urged to avail themselves of opportunities to take up the Institution of Gas Engineers Salesmen's Course.

On welfare, it was noted with interest that active social and recreational clubs were now running at many undertakings, and with further extension of these activities, some form of inter-undertaking competitions might be organised.

## Parliamentary Secretary's Swan Song

ON the lighter side, Saturday found some members of the conference with their chief guest supporting the Welsh Amateur Association Football Cup Final, happily fortuitously again played this year at Aberystwyth when the conference was in session. Other members took advantage of the break to visit the beauty spots of Cardiganshire, and in particular 'Hafod,' well known to the readers of 'Peacocks in Paradise.' Finally, the devotees of the Royal and Ancient Game, on Aberystwyth and Borth Golf Courses, lined themselves behind the Chairman and Deputy Chairman in a match which resulted in a victory for the former by four matches to one.

The conference had the honour, on its last two days, of a visit from Mr. Alfred Robens, M.P., then Parliamentary Secretary to the Ministry of Fuel and Power and now Minister of Labour. He spoke at the Saturday evening session of the conference. His talk was strictly 'off the record' and equally 'off the cuff.' There can, therefore, be no report of what he said on this rather historic occasion. It was, as we now know, the last statement he made as Parliamentary Secretary to the Ministry of Fuel; we gather it was a racy, brilliant and masterly statement of fuel problems in Britain today—a fitting 'swan song' to his four years as Parliamentary Secretary for which the conference evidently awarded him the highest honours. The enthusiasm of the conference was to be seen in the spontaneous tributes to Mr. Robens by managers in the free discussion which followed his talk. Mr. K. E. Tiddy (Manager of Carmarthen and Chairman of the Carmarthenshire Group) expressed the feelings of the conference when he said 'I have been in the industry 25 years and have waited for 25 years for this moment. What Mr. Robens has just said has given me more encouragement personally than anything else I have come across for very many years.'

With Mr. Robens, other distinguished guests were invited to dine with the conference on Saturday night, including Mr. Roderic Bowen, M.P., for Cardiganshire, Dr. Thomas Jones, C.H., formerly Deputy Secretary to the Cabinet, Vice Chancellor Ifor L. Evans of the University of Wales and Principal of Aberystwyth College, Mr. J. Morgan Jones, Permanent Secretary to the Welsh Department, Ministry of Agriculture and the Mayor and Town Clerk of Aberystwyth.

The gas industry and the Wales Gas Board, as the Chairman put it, were good citizens of Wales as of every town where they had an undertaking. He welcomed the opportunity of members of the conference meeting, as they did, men who were playing so large and important part in the public, economic and cultural life of Wales and the country at large.

Mr. Roderic Bowen, M.P., in a welcome to Mr. Robens, even found a new function for the Wales Gas Board—that of advising the Prime Minister as to the selection of a capital for Wales. He took note of the fact that the Board now held its area conferences at Aberystwyth, the town in his constituency whose claim to be recognised as capital was now before the Government.

The Chairman, in inviting the company to praise famous men and do honour to one of the greatest Welshmen of the 20th century, Dr. Thomas Jones, C.H., said that he had shown in his youth the first signs of that wisdom which had made him the confidant of Prime Ministers for two decades and that genius that had made him the inspiration behind such bodies as the Pilgrim Trust and the Arts Council, when in the 1880's, in the Rhymney (Mon.) Working Men's Club, he had successfully carried the motion 'that gas is to be preferred to every other fuel!'

## *COMPANY NEWS*

### POWER SAMAS

At the annual general meeting of Powers-Samas Accounting Machines, Ltd., held on May 7, the Chairman, Sir Alexander Aikman, C.I.E., in the course of his speech, said: Our intake of orders achieved an absolute record by a considerable percentage. Our exports in 1950 were seven times those for 1946 and almost twice as much as we delivered in 1947. The expansion planned in overseas territories for 1951 will more than maintain these proportions. The consolidated trading profit for 1950 of £1,040,401 is slightly less than that of the previous year. The group net profit for the year of £701,437, shows a decrease of some £74,000, which reflects the drop in trading and also absorbs the increased charge in 1950 for depreciation, occasioned by the fact that in that year we put on rental a greater volume of machines than ever before.

The net profit available for distribution amounts to £361,437 as against £325,123 for 1949. The directors recommend the payment of a final dividend of 27½%, less income tax, making with the interim, 45% for the year, leaving a balance of £232,737 to be retained in the business, £225,000 being transferred to general reserve and £7,737 carried forward. The consolidated balance sheet reveals a state of affairs of which the company can be justly proud. Total assets held, at book values, amount to £4,444,748, against which must be offset total current liabilities of £1,716,292, an increase of £71,147, leaving a net worth of capital and reserves of £2,728,456, which is an increase of £185,140 within the year.

# EAST MIDLANDS CONFERENCE

## *Notable Gathering at Skegness*

THE second area staff conference of the East Midlands Gas Board attended by officers of area, divisional, sub-divisional, and district level, was held at Skegness on May 3 and 4. All the sessions were presided over by Mr. H. F. H. Jones, M.B.E., Chairman of the Board, and he was supported by Mr. Sydney Smith, Deputy Chairman, and other members of the Board.

At the opening meeting of the conference Mr. S. Chester (Chairman of the Skegness Urban District Council) officially welcomed the delegates on behalf of the Urban District Council, and formally opened the Conference.

**The Chairman,** having thanked Mr. Chester, and before giving his opening address said it had been hoped that Mr. Robens, formerly Parliamentary Secretary to the Ministry of Fuel and recently appointed Minister of Labour, would have been present, but he was prevented by Parliamentary duties from coming. Sir Edgar Sylvester, Chairman of the Gas Council, had also been prevented from coming as he was helping in the opening of the Festival of Britain. However, the conference would be addressed by Colonel H. C. Smith, Deputy Chairman of the Gas Council.

[Colonel Smith's address was published in last week's *Journal*, p. 364.]

In his address Mr. Jones explained that since last year they had broadened the basis of the conference, and guests would include the Deputy Chairman of the Gas Council, the Secretary of the Gas Council, the Chairman of the North Eastern Division of the National Coal Board from which some of their coal supplies are drawn, the Secretary of the East Midlands Electricity Board, Mr. G. Le B. Diamond, Chairman of the West Midlands Gas Board, representatives from the Area Joint Council for Gas Staffs and the Area Joint Industrial Council, and representatives of the Gas Consultative Council.

Continuing, Mr. Jones said that during the coming year they hoped to see further improvement in their 'housekeeping methods.' They would, strengthen the accounting organisation so that information which had to be obtained at present by much painful research and hard work would be produced automatically during the normal course of operations, and so that accurate comparisons could be made between the costs of working in the varous divisions, works, and so on. Similarly, they hoped to continue with the improvement of the technical efficiency, which was already reflected by a steady improvement from week to week in the operating results of the works by comparison with the previous year.

### Tariff Uniformity

An important matter was under discussion with the Consultative Council. The Board took over hundreds of different tariffs, for ordinary consumers, prepayment consumers, commercial consumers, industrial consumers, and all sorts of special categories of consumer.

They could not eliminate differences very quickly, but some degree of uniformity must be introduced step by step. What the Board had decided was this. They considered that in broad geographical zones the price of gas should bear relation to the cost of giving a supply, but that within those zones there should not be a variation between one town and other, or between the outer areas of some of the old gas undertakings and the inner areas. Their plans were not yet complete but they had as a first step devised 13 tariff zones. It might be that the price of gas in more than one zone would turn out to be the same. In other words, two or three of their present zones might be merged to form one larger zone. They proposed to dispense with meter rents. On the other hand, they considered that the consumer cost, such as of providing a meter, of rendering an account, of laying a service pipe, of laying mains, and the cost of the Board's administration, should be reflected in the initial blocks of consumption by each individual consumer so that those consumers who were prepared to use gas for a greater variety of purposes than others would obtain a benefit by purchasing gas at a lower rate once they had passed the initial consumption.

Details of their proposals were being discussed with the Gas Consultative Council, and it was expected that they would start to introduce their new tariff in different zones as from the autumn.

### Increase Not Enough

They had had to increase all their charges for gas by 10% as from April 1, and their latest calculations showed that the increased income which they would obtain from this surcharge would be nowhere near sufficient to meet the increased costs with which they were faced. It was small comfort to know that, but for the large increased costs which they were having to meet of coal, oil, rail transport, wages, salaries, and general stores, they would have been able to show substantial savings in the cost per therm of gas supplied equivalent in a full year to not less than £350,000.

The new tariffs would in the first place, be applicable to domestic consumers only. Other tariffs would be dealt with

Our photograph of the platform group shows, left to right, Mr. le B. Diamond, C.B.E., (Chairman, West Midlands Gas Board); Mr. T. W. Kerry, J.P., (Member of the East Midlands Gas Board); Col. H. C. Smith, O.B.E., (Deputy Chairman, Gas Council); Mr. H. F. H. Jones, M.B.E., (Chairman, East Midlands Gas Board); Mr. Sydney Smith, (Deputy Chairman, East Midlands Gas Board); Alderman C. R. Bates, O.B.E., J.P., (Member); Mr. Frank Lee, B.A., B.Sc., (Member); and Mr. A. T. Raby, (Education and Welfare Officer).

in due course. They were making a close examination of the whole position and hoped to introduce industrial tariffs in each division which might be different as between divisions, but which would be similar within the boundaries of a division, with the prices related to the tariff zones which he had referred to earlier.

They had also to consider the prepayment consumer, and they have in mind the possibility of restricting the prepayment surcharge to the initial block of the tariff, placing the prepayment consumer so far as his consumption beyond the first block is concerned, on the same terms as the ordinary consumer.

Mr. Jones added: For some time we have had in mind getting more cookers and having regard to the steel shortage we have considered the possibility of having a cast iron cooker built for us. To that end we negotiated with Thomas De La Rue & Co., Ltd. The cooker is the result of 18 months of research and negotiations. It was decided at the end of 1949 that if conditions necessitated the Board having to offer either a long term hire purchase or a cooker on hire, then our needs would be best suited by a cast iron cooker of modern design. With this in mind our negotiations proceeded and the cooker you see today is the outcome. It is made to the requirements of the Board and to various British standard specifications. It has been fully tested in the Watson House laboratories and production will commence in May. At first the output will be small but by the autumn it is hoped that it will amount to several hundreds a week unless conditions become even more unfavourable than they are at the present time as regards raw material. The cooker itself should suit the needs of the normal domestic consumer, having a large oven automatically controlled and a good sized hotplate with four rings and a large grill. It is solid and should stand the test of time, but for all that it is moderately priced and will fall into the 'popular' range of gas cooker.

# THOUGHTS ON MANAGEMENT

By SYDNEY SMITH,

Deputy Chairman, East Midlands Gas Board

BEFORE the advent of nationalisation our divisional general managers, sub-divisional managers, and the majority of local managers were accustomed to running their own gas undertakings, with responsibility only to a board of directors or to a gas committee. They were concerned mainly with their own internal affairs and, apart from the implementation of regional agreements on wages and conditions of employment in federated undertakings, they were generally free to follow individual preferences within the policy laid down by their boards or committees; and those policies were influenced to a very great extent by the managers themselves in their capacities as advisers. As part of a large organisation they were bound to find life very different because, in working towards the success of the organisation as a whole, every person concerned must be prepared and willing to contribute a large measure of co-operation in order to bring about the co-ordination of all matters concerned with the implementation of a common policy.

For the successful operation of an organisation of this type, it is necessary to hold the balance between allowing each individual to go his own way and so accept the risk that he will sometimes do things which are contrary to accepted policy, and laying down rigid rules and regulations which may restrict initiative, destroy enterprise, and lead to general frustration.

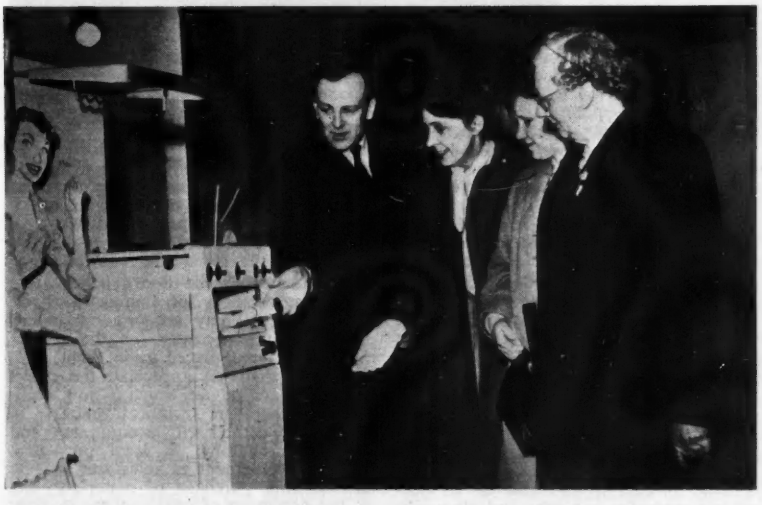
One of our greatest difficulties is to ensure that the policy of the Board and the reasons for certain decisions are fully explained to and understood by managers and every one concerned with administration; and at the same time to make use of the combined knowledge and experience of managers and others with executive responsibility, who may sometimes feel that their suggestions do not always get very far. To this end, full-time members of the Board hold a monthly conference with divisional general managers and senior executives. Reports are received on relevant matters arising at meetings of the Gas Council and of its constituent committees and joint councils, on which the Board are represented. In addition, reports are considered of regular meetings of the following *ad hoc* committees within the Area: commercial, purchasing, installations, divisional engineers, and the liquor effluents committee set up jointly with the Institute of Sewage Purification. Regular meetings of divisional accountants also take place, at which the Chief Accountant presides. In this way all problems concerned with and arising from the complexities of day-to-day administration and technical operation are considered, and matters of policy discussed.

Similarly, divisional general managers confer with and take into their confidence managers and heads of departments in their divisions. Board policy is passed on, and the requirements of managers and their proposals for the improvement of undertakings can be fully considered, as can their views on the various policies laid down.

The Board believe that they have left managers reasonably free to exercise personal initiative in many ways, with restraint being placed upon them mainly in two directions—firstly, in the sanctioning of capital expenditure, which, of course, entails the spending of public monies; and secondly in matters on which it is necessary for all concerned to speak with one voice.

The sanctioning of capital expenditure, which in the past was the responsibility of boards of directors or gas committees, is now subject to limitations according to the magnitude and cost of the project; a common price policy has been laid down for the sale and servicing of appliances; and in matters concerning industrial relations there is the obvious necessity for having a close degree of co-ordination in order to ensure that all employees are treated equitably, and that a balance is maintained between comparable jobs in different parts of the area.

Outside these matters there is a wide sphere in which managers not only can but must exercise their initiative and carry responsibility; and it need hardly be said that in matters connected with capital development or with wages and



*Mr. H. R. Hart (Commercial Manager, East Midlands Gas Board) demonstrates the new cast-iron cooker.*

salaries, full consideration will be given to the recommendations of the man on the spot.

In connection with sales and service, appliance prices and service charges have been standardised on a uniform basis throughout the area, but managers are free, and indeed they are expected, to promote sales within the price policy and within the present reduced scope of publicity.

Very little thought will make it obvious that no large organisation can possibly allow freedom in those matters upon which restraint has been placed. Moreover, in case anyone should think that the organisation of the Board is something peculiar to nationalisation or to the East Midlands area, I would ask him to consider for a moment any organisation he will—Woolworths, for example, or Boots. Can you imagine what would happen if the local managers in the various towns and cities up and down the country were allowed freedom to pay what they liked to whom they liked, without regard to the numbers employed or to the volume of business; to decide for themselves what they would sell and what they would not; to determine their own methods of accounting, allocation of expenditure, and margin for overheads according to individual whim; to buy singly in the open market and to sell their goods at the prices they each thought best? Quite obviously their employees and their customers would soon be up in arms; the business would be out of control and the firm would quickly finish up in the bankruptcy court.

## A Natural Pyramid

I do not often wax biblical, but the other day in a publication of the British Institute of Management, I came across a quotation which struck me as particularly appropriate to the subject of organisation. For the non-theologians among us, the reference is the Book of Exodus, Chapter 18, verses 25-27, which reads as follows:

> 'And Moses chose able men out of all Israel, and made them heads over the people, rulers of thousands, rulers of hundreds, rulers of fifties, and rulers of tens. And they judged the people at all seasons: the hard causes they brought unto Moses, but every small matter they judged themselves.'

In this regard, our set-up has taken the form of a natural pyramid. The local manager has freedom to engage manual workers within the confines of the undertaking's requirements, and general managers have similar freedom concerning most intermediate grade employees within their divisions. The engagement of all salaried staff within the limits of the national scales of salaries is a matter for the Industrial Relations Officer and the full-time members of the Board, while the engagement of all senior staff requires the approval of the full Board, including the part-time members. It is also our policy to advertise all staff vacancies, unless there are good and sufficient grounds for not doing so in special cases; and, whenever possible, we fill such vacancies from among our own employees and thus ensure, as far as possible, that promotion takes place from within the area. The experience of the past two years has proved beyond all reasonable doubt the very great value of these arrangements. They work smoothly and make certain that a common policy is followed in all sections and in all departments throughout the Area.

## Personality

But among other things, man management is still the function of the local manager, and one of his most important functions—in fact, one of the principal attributes of a successful manager—is his ability to obtain the best possible service and response from the men under his charge. National and area agreements may lay down the appropriate rate and condition of employment for a job, but these are the bare skeleton or framework within which the manager operates. It is his personality, his drive, his tact, his ability successfully to handle men which attract and retain the men's respect and, incidentally, go a long way towards retaining the men themselves. The manager must, therefore, earn a reputation for integrity and fair dealing; he must keep constantly in mind that each man is a human being with a personality peculiar to himself; that no two personalities are exactly similar; and that his duty is not only to one man or group of men, but to *all* men under his control.

The object of placing restrictions on the freedom of managers in matters concerning wages, salaries, and conditions of employment is merely to extend this principle to all undertakings and to all employees. Our friends in the trade unions know just as well as we do that men will accept fair treatment, but they will not tolerate what they believe to be favouritism or injustice; nor will they work contentedly in the knowledge that men are being paid more to do similar work in a neighbouring undertaking in the same provincial grade.

It is said that leaders of men are born and not made; whether or not this is the case, it is certain that the successful handling of men requires the constant application of an intimate knowledge and a sympathetic understanding of nature, which can be acquired only from a conscious and sympathetic study of human beings. Remember that men are not pieces of furniture or figures in a book. Weigh-up each man as an individual; study his strengths and his weaknesses in various situations; endeavour to assess his character and his potentialities; and remember also that a man by himself generally shows characteristics different from those shown when he is surrounded by his colleagues; so that the manager, in addition to weighing-up the man as an individual, must also be able to assess the mass feeling of a group of men.

Any manager who has acquired this art, and most of our managers have it to a greater or lesser degree, can usually avoid trouble by knowing instinctively how best to put things across to his men; and similarly, to read the danger signals and so forestall trouble before it has a chance to develop. We are all open to improvement, and if each one of us in his daily job actively and consciously gives attention to improving his knowledge of psychology we shall not only improve our self-respect and our ability as managers but our jobs will become easier and our efficiency greater. Sit back occasionally and take thought on this; for the sympathetic handling of human material is a serious charge on the conscience of us all. Until this is realised and put into practice, discontent may well be with us in one form or another and at the risk of appearing trite I would also remind you that no man can successfully discipline others until he has learned to discipline himself.

It may be that in a few cases the control of the Board is thought to be irksome; if this is so, it is because we are striving to obtain a higher standard than previously obtained in some undertakings. We are aiming at a higher technical standard of operation on the works and a higher standard of mainlaying and fitting work on the district. In certain cases there may be a feeling that what was good enough in the old days is good enough now, but there is reassuring evidence of improvement where it was most needed, and of a general desire to achieve the standards required.

On the whole, the Board believe that the great majority of managers cheerfully and willingly accept, and indeed recognise, the necessity for the restrictions which are placed upon them, and, moreover, that they appreciate the expert assistance and advice which is now available to them in technical matters; in matters concerned with accountancy and industrial relations; in legal problems; in the development of sales and service; in the bulk purchase of materials; and in the procuring of coal and the marketing of by-products.

At this stage I would like to say a

*Three members of the staff who gave papers at the conference: Left to right, Mr. J. B. Walsh; Mr. A. Wylie; and Mr. A. T. Raby.*

word about our friends the accountants and their influence within the organisation. In the very early days and after much careful thought it was decided that the accountancy set-up should be somewhat on the basis of a separate organisation with a separate 'line of command' complementary to, and in line with, normal administrative channels. It is, of course, axiomatic that where public monies are involved, the person who authorised expenditure should not be the one to handle or record payments.

After the passage of a few months there were signs that certain individuals on both the accounting and non-accounting staffs were strict disciples of Euclid in their views on parallel lines; not only did the lines not meet, but they showed little signs of ever coming together, and it seemed for a time that once again we were liable to be faced with the same situation which had occurred so many times in the past, where engineers and managers were at loggerheads with accountants.

This was what we might call a 'teething trouble' which we endeavoured to overcome by a compromise arrangement while relying on the good sense and co-operation of the persons concerned; but it might quite well have had unfortunate consequences for both the organisation and the individuals, and it could still happen if any tendency to pull in different directions developed.

It seems so obvious that every section of our organisation is complementary to the whole, and that only by close and friendly liaison between all sections and between individuals can we hope to obtain the greatest measure of success from our combined efforts.

# Bristol Gasworks Extensions

COINCIDENT with a meeting of the South Western Gas Board in Bristol, the opportunity was recently taken to invite the Lord Mayor (Alderman F. A. Parish), leading civic dignitaries, and officials to inspect the reconstruction scheme at the Stapleton Road works of the Bristol sub-division.

Accompanied by Mr. C. H. Chester, C.B.E. (Chairman), Mr. E. R. V. Porter, O.B.E. (Deputy Chairman), and other members of the South Western Gas Board, together with Mr. James Carr, M.B.E. (General Manager), and Mr. C. R. Ingham (Manager, Bristol sub-division), the Lord Mayor was shown over the site, and officially started the construction of the foundation of the new retort house by operating a concrete mixer. After the ceremony, a luncheon was held at Radiant House, Bristol, and the visitors inspected plans, photographs and drawings of the new works, and others throughout the Board's area. Mr. Chester presided and said the Lord Mayor had started that morning the construction of the most modern conception in gas manufacture. It would be the largest plant south of Birmingham and west of London.

They were justly proud of the record of housing in Bristol, and, of course, they had a pecuniary interest, for 90% of houses had a supply of gas for cooking. The Board, he continued, was a great believer in decentralisation and in leaving the responsibility to the men on the spot. Their duty was to provide the best possible consumer service.

The new carbonising plant will consist of four benches of 32 continuous vertical retorts, capacity 10 mill. cu.ft. per day, by West's Gas Improvement Co., Ltd. Contractors for the coal handling plant are Strachan and Henshaw, Ltd.; the coke grading, handling, and storage plant, W. J. Jenkins, Ltd.; 6-mill. cu.ft. gasholder, Oxley Engineering Co., Ltd.; railways, Nott Brodie & Co., Ltd., and Thomas Summerson & Sons, Ltd.; diesel locomotive, Ruston & Hornsby, Ltd.; weighing machines, W. & T. Avery & Co.

When complete the extensions will augment the output from Stapleton Road works to 15,500,000 cu.ft. a day, and a further installation is planned for the future which will bring the output to 25,500,000 cu.ft. a day.

*The Lord Mayor of Bristol (Alderman F. A. Parish) operates a concrete mixer to start the construction of new retort house foundations at Stapleton Road gasworks. Behind the Lord Mayor, left to right, are: Mr. C. R. Ingram (Manager of the Bristol sub-division); Mr. C. H. Chester (Chairman of the S.W.G.B.); Alderman L. Easterbrook (Member); Mr. J. Carr (General Manager); and Mr. A. W. Grant (Member).*

## *COMPANY NEWS*

### GLOVER & MAIN

The annual general meeting of Glover and Main, Ltd., was held at 48, Grosvenor Gardens, London, S.W., on May 9, Col. W. R. Glover, C.M.G., D.S.O., T.D. (the Chairman), presiding.

The following is an extract from his statement: Throughout the year your factories have operated at capacity with the exception that their production has been limited by raw material shortages, especially in steel. Plant expenditure has been largely directed to complete your company's long-range programme. More than £80,000 has been expended during the year, making a total of approximately £400,000 over the last five years to improve economy in production. Some £50,000 of plant is on order and still to be delivered. We made another record number of meters during the year under review, and although on the cooker side we have stepped up production, it is nothing like our full capacity due to limitation in supplies of raw materials.

We have new types of meters on the stocks and have also developed a new gas cooker of modern design. The latter is a popular-priced cooker of high grade appearance and excellent performance, and we feel sure the marketing of this will enhance still further the great reputation we earned in pre-war days when we were able to operate at full capacity and supply the popular cooker of that day in ever-increasing quantities.

# Compensation Values

The Minister of Fuel and Power has declared by Order that the values of the undermentioned securities have been determined under Part II of the Act, the Conversion Date being May 1.

In the case of these securities the Gas Council is arranging that the payments of interest made on May 1 to the appropriate holders are such as to discharge in full all outstanding interest accrued to April 30, 1951, on the British gas stock issuable by way of compensation.

The securities are all in £100 units.

| Company | | Compensation Value. |
|---|---|---|
| Cleethorpes ... | 5½% Red. Deb. Stock | £116 |
| Do. ... | 5% Red. Pref. Stock | £101 |
| Do. ... | Cons. Ord. Stock | £127/10/– |
| Do. ... | New Ord. Stock ... | £127/10/– |
| Royston ... | 4% Red. Mort. Deb. Bonds ... ... | £101/10/– |

# FUEL POLICY

[*From a Presidential Address to the Institute of Fuel*].

By J. F. RONCA, O.B.E., A.R.C.Sc., A.R.I.C., A.M.I.Mech.E., Hon.M.Inst.Gas E.

THE suggestion has repeatedly been submitted by many of our members that the Institute of Fuel should elaborate a national fuel policy. In this context I take 'policy' to indicate a scheme or set of principles whereby the State may best attain the ends desired. To reinforce my reference to the necessity of clear definition, I would direct attention to the varied meanings attached to the terms 'efficiency' and 'economy' as used in current discussions.

We can all think of circumstances wherein equally well qualified technologists would hold differing opinions. Were the institute to give advice, it might well be that individual members would dissent. This point is exemplified by our practice, when we publish a paper, of embodying a disclaimer of responsibility for views and statements contained therein. Responsibility remains with the author. Thus, even had the Institute power to give advice, which it has not, the exercising thereof might be the source of serious internal dissension.

When, however, we consider the proposal that the Institute should formulate a national fuel policy, the objections to such a proposal become still greater.

A national policy on any matter may be compared to a cut jewel, whose many facets must be so shaped and oriented as to present the best general effect. Some stones may be better as 'traps,' other as 'brilliants,' others as 'crowns,' and some can be never more than 'industrial.' The lapidary viewing the raw stone must determine the form it shall be given. Likewise those responsible for a national fuel policy must first form a mental picture of the numerous possible facets and thereafter associate them to the best advantage. Those upon whom the burden lies most certainly have at their disposal not only the full scientific and technical aspects (including economic) but many others as well. The purely technical aspects may well extend beyond the realm of the fuel technologist—medicine, agriculture, water supply, sanitation, in its widest aspect, must all be taken into account—and, apart from the technologies, great consideration must be given to the aggregate reactions of current public opinion to the projected policy; human relationships and possible international complications must all be reviewed.

## A Government Responsibility

In short, a national fuel policy can be devised only by the Government of the day in the light of integrated knowledge garnered from all sources.

Under the stress of international strife and distrust there has crept upon our civilisation the penumbra of a New Dark Age. No New Dark Age such as Tennyson erroneously envisaged, but one comparable with the real and original Dark Ages when the Abbot, described in Kipling's 'Eye of Allah,' shattered and burnt the first microscope in order to suppress knowledge which he feared might be used to mankind's detriment. Today knowledge in one particular field of technology —which in the limit may be regarded as a branch of fuel technology—is by law hidden in a cloud of secrecy utterly abhorrent to the untrammelled scientific spirit. Yet viewing, as citizens and not as specialists, all the circumstances, who would dare say that in determining the national policy on atomic fission those responsible for the banning edict should have settled the question on technical considerations only?

May I remind you of another very recent case wherein a national fuel policy is now in its birth pangs. Today in the lands which cradelled the human race there is a fuel policy to be determined by the nations of the earth—one of most cogent importance in the realms of fuel—and would it be unfair to our profession to say that the fundamental considerations at stake, and the factors to be considered, are essentially non-technical? I think not.

Economy is a word of varied meaning. Good housekeeping, wise husbandry, operation without avoidable waste, operation at minimum cost, and even downright niggardliness and excessive sacrifice are all at different times labelled 'economic.' Ordinarily we associate the word with basically sound operation and thus tend to assume that economy is ever to be attained, which is certainly not true if, for instance, we attach to the word either of the last two mentioned implications.

In times of dire shortage we may—because we have no option—have to be niggardly or to work at minimum consumption regardless of everything else, but we must not be deceived into preaching that these are ends for which we should battle. Efficiency in the sense of overall merit in operation without avoidable waste is greatly to be prized and sought for, and in times of fuel shortage emphasis is very properly laid upon the importance of thermal efficiency, and greater weight is rightly placed upon the fuel economy factor in comparison with other factors than would normally be the case; but, even in such times, the value of the other items does not vanish to zero, and thermal efficiency, as distinct from overall considerations, must not be obtained at any cost however, high.

## Need for Clear Statement

To such as may say that in so stressing the necessity of crystal-clear statement much too great importance is being attached—in a realm of things—to mere words, I would say that in science the first essential is to follow the Euclidian practice of clearly enunciating any problem to be solved. This enunciation is no mere drafting matter to be left in the hands of secretaries or legal draftsmen. It must be done by the Head, and all that is connoted thereby. In developing the statement of any problem—in distilling the 'Notes of Interrogation' into the Essence of Query, most amazing things are discovered, and when the statement is clear the problem is halfway to solution.

I think that excessive enthusiasm for 'thermal efficiency' regardless of other considerations, including that of the balance-sheet, may tend to bring the technologist into disrepute among those administrators of business who control the purse strings. These, after all, are the men who must be convinced if money is to be spent on measures to improve fuel economy, and to effect this conversion we must present the case in clear-cut terms with data and arguments which they can appreciate.

A technologist should regard himself as an ambassador to progressive industry, presenting with one hand the prizes of applied science and with the other the itemised account showing the profit and the cost which winning the prize involves. The account must be such that it can be followed by those who have to justify their financial operations—and those who by law are themselves responsible to their shareholders. I suggest that in no event should a 'technologist,' as distinct from what is sometimes termed the 'pure scientist,' indicate that fuel efficiency should be secured regardless of cost—rather should he demonstrate in detail that his recommendations directed to secure fuel economy will provide a valued contribution to the net maintainable revenue.

From the very beginnings of our Institute we have had presented to us, and have debated, papers on fuel economy

and thermal efficiency. These papers have been in the main concerned with the physical and chemical issues involved. The economic and financial aspects have not normally been heavily stressed. Arguments for economy presented to our own selves—especially those of us who attend Institute meetings—are addressed to the converted, and it appears to me that in order to strengthen our efforts to secure the installation of fuel-saving plant and apparatus we should deal in greater detail with the costing side of our proposals. Those who may object that these opinions tend to emphasise unduly the profit motive should bear in mind that technologists are necessarily concerned with industry and that in industry, and rightly so, whether we like it or not, 'money talks.' Moreover, the only way of quantifying on a common basis the relative values of such items as fuel, quality of product, capital costs, repair and maintenance charges—including 'availability'—is in terms of monetary currency.

The worth of the fuel saved must be set against all the other items in terms of the common unit. At today's fuel prices the value of fuel which can be saved—especially if there be added thereto, as there should be, an amount representing insurance against plant stoppages, will be found in innumerable cases to offset and much more than offset the costs of the improvements involved. If we attempt to press beyond this we are likely not only to bring ourselves into disrepute in the board room, but to sell the whole cause of applied science to reluctant reactionaries such as believe that 'the plant has worked very well hitherto.'

We can all think of instances proving the necessity of this balanced judgment, and sometimes the scales turn in favour of thermal efficiency and sometimes they do not.

It is quite common practice to install as part of the gas-making unit, even on the best managed works, plant for the production of carburetted water gas, notwithstanding the fact that the gas it produces is more expensive and the process is less efficient thermally than is that of carbonisation. The commercial value of being able to bring the plant into full production at very short notice, and the lower capital cost, overbalance the lower thermal efficiency. This instance represents no minor fuel consumption, for in the year 1948 some $1.3 \times 10^6$ tons of coke were used in gasworks in this country with over $120 \times 10^6$ gal. of oil to produce upwards of $74{,}000 \times 10^6$ cu.ft. of carburetted water gas.

Let not the Institute of Fuel stray from its own field into other realms; let it provide facilities for spreading knowledge regarding fuel and its uses, and so ensure that its members have every opportunity to formulate clearly our basic fuel problems and become aware of the various technical methods whereby these problems may be solved. If thereafter in the light of knowledge so gained our members as individuals alone, or in association, wish to carry missionary work beyond this stage, so be it; but the wider activity is not for the Institute and if attempted would lead to internal dissension. Moreover, if greater heed is to be paid to the advice which we, as individuals, tender, such advice must be so given that its soundness becomes patent, particularly to those who have power to act upon it. Also, let us distinguish short term from long term large project developments. In respect of the former, if our efforts are to become fruitful at an early stage we must see to it that recommended changes in plant or practice are on such a scale that in a world of limited labour, material, and time they are practicable. In regard to the latter, it is but rarely that specific advice can safely be given without further *ad hoc* investigation. Technologists have no wand which by mere waving can open forthwith the gates of Utopia.

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# RECENT DEVELOPMENTS IN GAS STREET LIGHTING

By P. Crawford Sugg

IN a paper given at a meeting of the Illuminating Engineering Society on April 10, Mr. Crawford Sugg detailed the improvements and changes which have been made in low pressure gas street lighting equipment since the end of the war.

The economics of gas street lighting, particularly those of Group 'B' lighting schemes, he said, have been greatly improved by changes in the design and construction of the lanterns which permit major revisions in the system of maintenance.

The first part of the paper described the changes made in a reflector lantern to obtain these results. These may be summarised as an increase of 40% in the efficiency of light production as compared with the old square lanterns, improvements in the technique of manufacture of the reflector system, and the devotion of considerable attention to the æsthetic aspects of the design, resulting in the passing of a bracket mounted form of this unit by the Royal Fine Art Commission.

Service duty tests were carried out on installations of this type of lantern, operating without any maintenance, over many weeks of severe weather. The chief factor affecting the duty of gas lanterns is the accumulation of dirt on the glassware. It was known from experience with older lanterns that a duty in service of 75% of the initial effect could be maintained, if necessary, under penalty, with fortnightly attention. The tests on the new lanterns, however, demonstrated that a duty of 70% of the initial light output could be maintained under similar conditions, when cleaning the new lanterns at five-weekly intervals. This was under severe winter weather conditions (including snow) in London. In normal weather the duty was, of course, still higher. It will be seen that this performance which permits a considerable reduction in labour is entirely consistent with the 60% (and preferably 70%) maintenance requirements stated to be desirable in the Code of Practice on Street Lighting recently distributed for comment. Satisfactory agreement has been made with the Trade Union concerned regarding this reduction in labour which resulted in doubling the number of new lanterns (as compared with the earlier types) in the care of each man. New automatic control equipment based on the use of a 42 day movement and the Solar dial has been introduced to take still more advantage of the reduced attention necessary for the new lanterns.

A new range of refractor panel lanterns for both Group 'A' and Group 'B' lighting was described, which is of good external appearance and extreme simplicity of constructional functions, the control of the light distribution being carried out by the use of diffusing or refracting glassware. The prismatic surfaces of the glass are covered to assist routine cleaning. Installations of these refractor lanterns were also subjected to the service duty tests mentioned above, and were found to show even less depreciation and similar advantages of notable economy of maintenance.

The normal scheme of maintenance for the new lanterns will envisage cleaning and clock winding at intervals of four weeks, with a small percentage of burner cleaning, and a time allowance for any unusual attention, such as may be caused by malicious damage or mechanical failure, together with a proper nightly patrol system. Such a maintenance system compares very favourably with those still in common use with the older lanterns, which involve weekly or fortnightly attention.

This advantage in maintenance cost, in conjunction with the greatly improved performance of the new lanterns and the possibilty in certain cases of making use of existing column equipment and services, has resulted in the increasingly wide use of these types of lantern, some installations of which were described and illustrated in the paper.

# On the Threshold of Development

By
W. O. KIRKWOOD
General Manager, Sunderland Division, Northern Gas Board.

*From an address as Chairman of the North of England Section of the Institution of Gas Engineers*

MY election as Chairman of the North of England Section of the I.G.E. is a case of history repeating itself, because it is the second time within three years that I have had the distinction of being elected to the chair of a re-formed technical body within the gas industry in the North. In September, 1948, I was honoured with the presidency of the Northern Junior Gas Association in the year in which it replaced the old Auxiliary Section of the Association.

Both the Junior Association and the District Section which we are inaugurating today owe their origin to the North of England Gas Managers' Association; and on an occasion such as this it is appropriate to make some reference to the origin of the North of England Gas Managers' Association, which has done so much to promote technical knowledge in this part of the country. It came into existence because there was a growing need for some organisation where there could be an exchange of ideas at a time of great expansion in the industry and considerable technical development. Within a short time it had proved of inestimable value in forging a strong link between those following the same profession in Yorkshire, Durham, Northumberland, Westmorland, and Cumberland, and, moreover, soon became an example for similar organisations which were springing up elsewhere in the country because of the broader basis upon which it was founded.

The inaugural meeting was held in the board-room of the South Shields Gas Company on April 10, 1877, when Mr. W. J. Warner, of South Shields, was elected the first President. The membership was 34, which was increased by eight full members and seven associates at the first general meeting, after which it is recorded in the minutes that 'members then proceeded to Redheugh gasworks, which they inspected, and subsequently partook of luncheon provided by the Gas Company in the large and commodious meter house.' The Association has continued to meet every six months during the past 74 years.

In 1907 it was decided that the normal half-yearly meetings should be supplemented by monthly meetings and so a General Purposes Section was formed to hold such meetings, and it became an invaluable addition to the bi-annual meetings of the Association. In 1918 there came another new development, and one of considerable importance, the formation of the Auxiliary Section to allow for meetings where there was more opportunity for free discussion among the younger members of the profession. Today it is soundly established, with a flourishing membership reaching the 200 mark, under its new garb, the Northern Junior Gas Association.

Looking back over the past 74 years, we can take pride in the efforts of the men who built the Association into what it is to-day. They were imbued with no thought of personal gain or personal prestige—their object was simply to make a material contribution to the industry and foster a real interest in technical development. Tinged with sadness as such an occasion as this must be at the passing of the Association, we must not lose sight of the future and the opportunities which we shall have to expand our scope as a district section.

It is fitting at this juncture to refer to the efficient service which has been given by Mr. Alan S. Middleton to the North of England Gas Managers' Association in the capacity of Hon. Treasurer and Secretary since 1944. It is a source of regret to me personally and everyone here today that Mr. Middleton has declined to take office in the new Section because he feels that, as it has now become a purely technical body, he must withdraw.

The Northern Junior Gas Association has always be closely connected with the senior organisation, and un our new constitution we are empowered to grant it affiliati I hope that it will be one of our first decisions to gra this affiliation, for we both have a similarity of purpose and outlook. The Junior Association will be permitted, afte affiliation, to nominate two representatives as members of the Management Committee, but without voting powers. I would also suggest that the Management Committee explore the possibilities of having regular joint meetings with the Junior Association when papers are presented which are of interest to both organisations.

There is no doubt that the bi-annual meetings of the Institution in London have not given adequate opportunity for discussion on the many papers and special reports presented. By having our own Section we shall be able t hold more frequent meetings and this will allow time to consider in detail the points which are raised in these excellent Institution papers. As Chairman of the new Section, I take the liberty of saying on your behalf that we shall be very pleased indeed to welcome the authors of these papers to our meetings in the future in order that we may gain from their specialised knowledge.

It is frequently said that the Northerner has an inherent objection to change. We do not easily depart from the ways of our fathers, but, once having accepted a new idea, I think it can be claimed that we carry it through with the same loyalty (and perhaps tenacity) we gave to the old. Today we stand on the threshold of great developments and I have every confidence that we shall not be found lacking in enthusiasm for our new District Section. It will continue to be an agency for the dissemination of the technical knowledge which is essential to a healthy industry and will ensure its advancement.

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**The Institution of Gas Engineers** announces publication of the 'grey edition' of the 11th Report of the Chairman's Technical Committee: 1949-50 (Communication No. 372/173) presented and discussed at the Autumn Research Meeting last November. It is available from the Institution, price 2s. 6d. per copy, post free.

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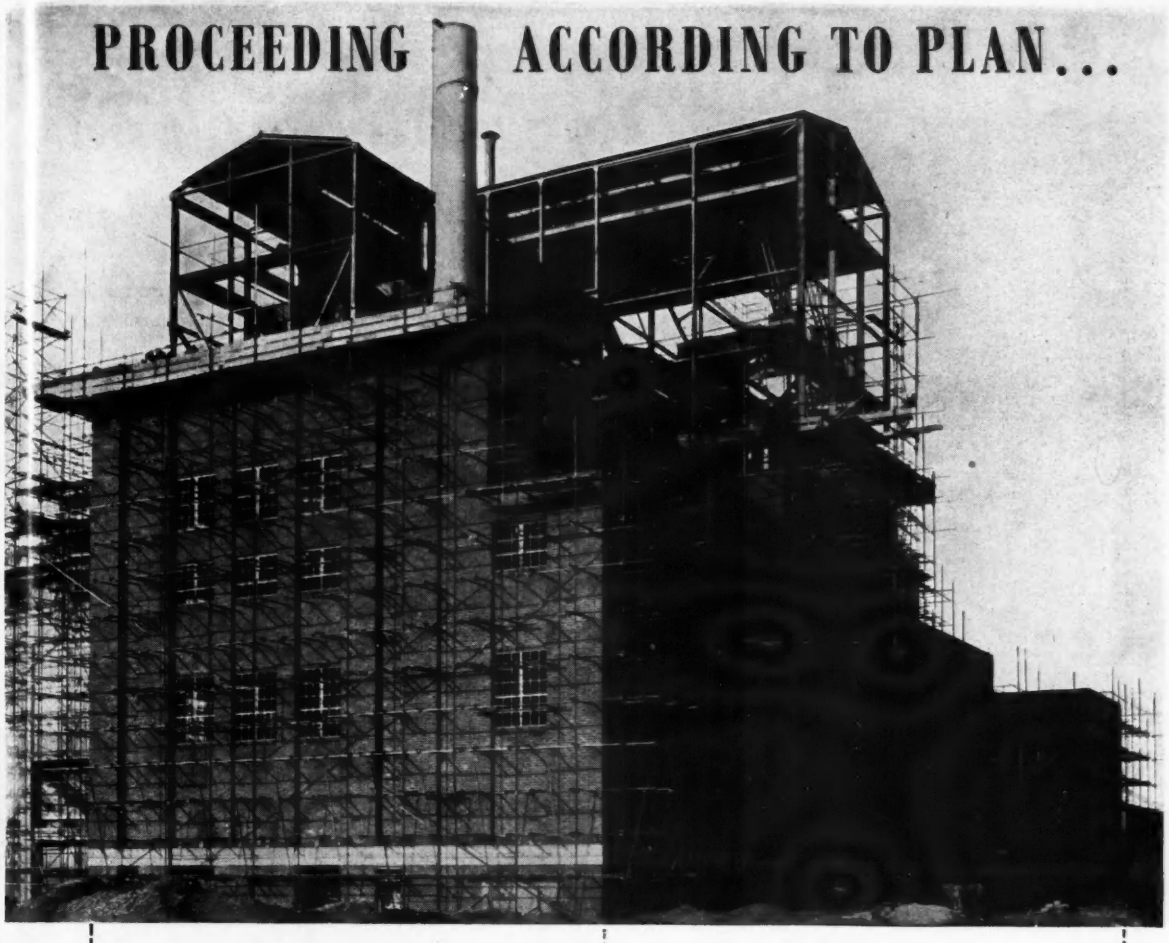

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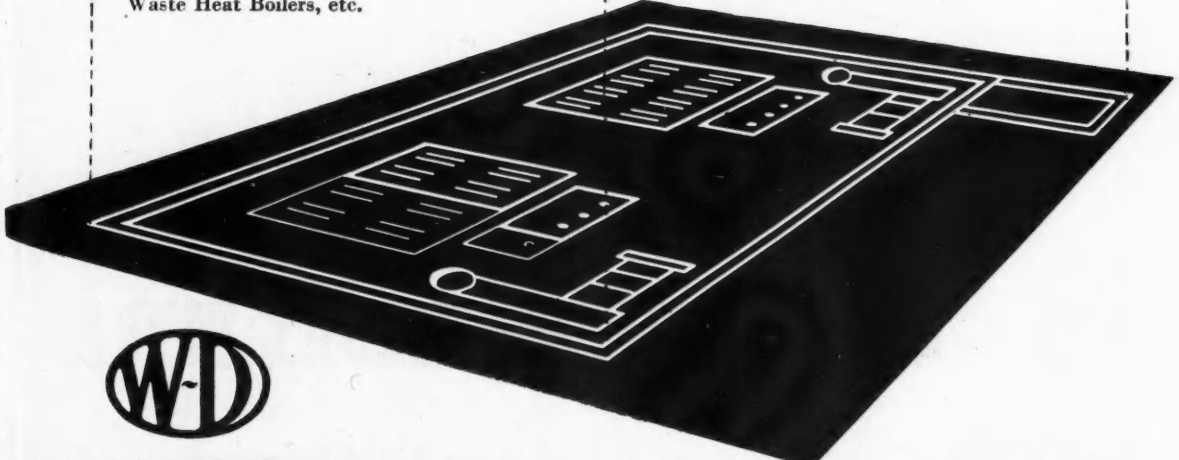

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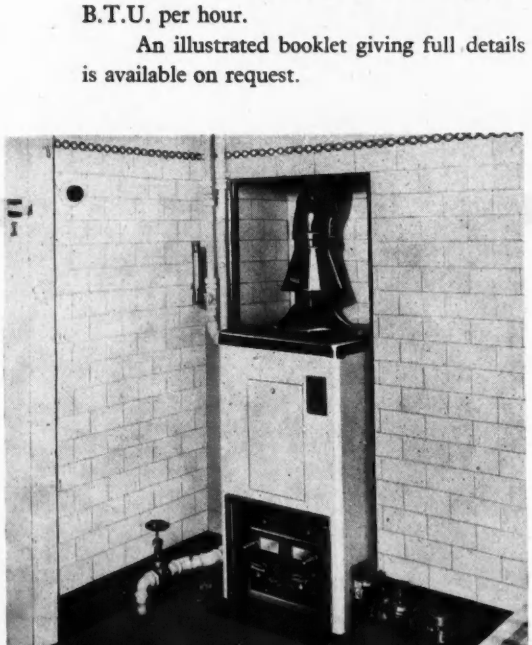

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# GAS AND COKE PRODUCTION
## —PRESENT STATUS AND TREND

By F. S. TOWNEND,
Woodall-Duckham Company.

**Abstract of paper presented to the Yorkshire Section of the Institute of Fuel**

THE gas industry and the coking industry, though both employing essentially the same carbonising process, have operated under different commercial conditions. In 1948 about 22¼ mill. tons of coal was carbonised in coke ovens and 24¼ mill. in gasworks. The gas industry has developed as a two-fuel industry employing several types of plant capable of carbonising a large variety of coals. It is under statutory obligation to maintain an uninterrupted supply of gas of constant quality; it operates in relatively isolated units varying greatly in size, often at long distances from the colliery. Experience shows that cultivation of the coke market to secure the highest possible monetary return for the coke leads to the lowest cost of gas production. On the other hand the coking industry has been developed to produce coke suitable for blast furnace or foundry use and only one type of carbonising plant, the horizontal coke oven, is in use. It requires good coking coals and tends to be concentrated in areas where suitable coals are mined. Recently coke oven plants have been built at the steelworks and drawing coal supplies from a number of collieries often over considerable distances.

The gas industry prefers to use coals with volatile content 33 to 36% with B.S. swelling numbers from 3 to 9, giving a good thermal yield of gas and a reasonably strong coke with reasonably low ash content. The coking industry uses coals primarily to obtain a strong coke, gas production is secondary; volatile contents vary over a wider range, 20 to 36%, but the swelling number is not generally lower than 4. Size grades of coal used in the two industries are to some extent complementary. In 1949 the coking industry carbonised 77.6% slack and smalls against 1.9% by the gas industry; 69.9% of the coals carbonised by the gas industry were large and graded, 28.2% unscreened. The reasons for this are the necessity for the gas industry to have coals with low ash content and the disadvantage of paying freight charges on the moisture contained in the wet slacks.

## Scope for Blending

In the coking industry the greatest scope for blending coal of widely differing coking properties is in steelworks plants to which coals have often to be railed over considerable distances. Blending is fairly general practice in the U.S.A., but deliberate blending is not greatly practised in this country. An example is cited of a plant designed to coke a high proportion of Notts. coal, B.S. swelling number 3 to 4, volatile content 37%. Blended 50 parts of this coal with 40 parts good S. Yorks. coal, swelling No. 8, and 10 parts S. Wales, volatile content 21%, it yielded a coke comparing favourably with a good S. Yorks. coke, justifying the cost of railing the good coking coals. Blending in the gas industry is conditioned by the relatively low yield of straight gas at a lower calorific value from non-coking coals. Successful blending in the gas industry would require constant supplies of selected coals at price differentials allowing for the difference in yields of gas and by-products.

The relative fuel economy in the four systems, non-recuperative continuous vertical retorts, recuperative horizontal retorts, recuperative intermittent vertical chambers and regenerative coke ovens is exhibited in the table from Finlayson and Townend's paper, I.G.E., Comm. No. 334, the overall net fuel consumptions, allowing for waste-heat steam and dry cooling of coke, being 23, 29.8, 25.8 and 24.5 therms per ton of coal carbonised respectively. 'The most promising direction in which further fuel economy in gasworks practice may be sought is by proper co-ordination of process steam and power requirements. Pexton has suggested that steam should be generated at 300-350 lb./sq.in. in both waste-heat and works boilers. It should be made to do work in a sufficient number only of steam-driven units to provide low-pressure steam for process requirements. The balance of the high-pressure steam should be utilised in turbo-generators. In coke oven plant Barritt and Finlayson have suggested that steam generated at 350-400 lb./sq.in. should pass only to exhauster turbines at 120 lb./sq.in., at which intermediate pressure steam would be taken for pumps, oil heater, rectification stills, etc. Liquor circulating pumps would exhaust at 20 lb./sq.in., at which pressure steam would be used in ammonia stills and wash-oil stripping stills. It is claimed that by this method a normal coke oven plant could operate with 200 lb. of steam per ton of coal carbonised against 400 to 500 lb. by existing methods.

Flexibility of gas-making plant is dealt with on the usual lines. The larger gas undertakings use auxiliary plant, generally C.W.G., to meet peak loads. Coke oven plant can vary gas output by alternative firing by producer gas and oven gas. It is recognised that in this practice more coal is used and more coke produced per therm of gas made available than in the normal practice of the gasworks.

The gas industry is faced with the problem of the coke/gas ratio. In practice approximately 2 therms of coke are produced per therm of gas made. The demand for gas tends to increase, 'but it is a matter for argument whether the sale of coke can be expanded in the same proportion.' Over the period 1921-48, the total gas available for sale from all sources increased by 103%, the total coal carbonised increased by only 55%, and the total coke and breeze made (less that used for C.W.G.) by only 62%. This is ascribed to two main causes—first, the make per ton at the gasworks increased from 12,320 to 14,700 cu.ft., largely owing to increase of steaming in continuous verticals, and secondly, whereas in 1921 the gas industry bought less than 1% from the coking industry, in 1948 it bought 11.75% of its requirements.

## Increased Steaming

The gas industry could reduce the coke/gas ratio still further, if required, by an extension of existing methods. If it were practicable to reduce the declared calorific value of the gas, steaming could be increased in those systems in which it is practised. Technically, the C.W.G. process could be used so that all the coke available was gasified on the works; economically, this method would be limited by the price of oil and its availability. The purchase of greater quantities of coke oven gas is the third means by which the supply of gas could be increased without increasing the amount of coke to be sold by the gas industry. The gas industry is already absorbing the bulk of the easily available supplies of coke oven gas. It has been computed that by equipping existing combination ovens with lean-gas heating a further 4% of the present output of the gas industry could be made available, and that if all the non-combination ovens were reconstructed to the combination type and put on lean-gas firing a further 6% could be obtained.

Future trends involving new developments include the methanisation of water gas, the furthest advanced of the processes which the gas industry has under active experimental investigation, and processes of complete gasification of which the Lurgi high-pressure process is finding commercial application in Germany.

'Co-ordination between the two industries, gasworks and coking, involves an appreciation of three factors—first, the statutory obligation of the gas industry to provide an adequate supply of gas to the consumer at all times; secondly, the maintenance of a balance between the therms of coke and of gas for sale; and, thirdly, the combined ability of the two industries to carbonise efficiently a wide variety of coal.'

# Town Gas from Weakly-Caking Coals

By J. G. KING, O.B.E., D.Sc., Ph.D., A.R.T.C., F.R.I.C., F.Inst.F.,
Director, Gas Research Board.

**In a paper to the Institute of Fuel the author reaches the following conclusions on the extended use of weakly-caking coals by the gas industry**

WEAKLY-CAKING coals could be carbonised in continuous vertical retorts in greater quantities than at present, provided they were available in sized form (doubles and trebles) of relatively low ash content. This substitution of normal gas coals would be economically sound only in districts in which the cost of transport of the coal was low, or if the cost of the coal could be made favourable since the substitution would be associated with a decrease of gaseous thermal yield of from 5 to 8 therms per ton of coal as charged, and a decrease of gas calorific value of 20 to 40 B.Th.U./cu.ft.

Weakly-caking coals could be used to advantage as blend components in continuous vertical retorts where coals of unnecessarily high caking power are now used. The advantages would be increased throughput, improved ease of operation of the retort, and increased reactivity of the coke.

Weakly-caking coals of small size grading could be utilised for blending in intermittent vertical chambers, or in coke ovens, to extend the usefulness of caking high-volatile coals. Durham gas coals (Type 401*b*) would absorb from 20 to 30% of their weight and Yorkshire gas coals (Type 502) about 20%.

Cost of transport is an important consideration in (2) and (3), whether of caking coals to areas deficient in them, or of weakly-caking coals for blending. A suitable coal price structure could play a considerable part in improving economics. In either case coke quality would be improved, but relatively low ash content of the weakly-caking coal is necessary. It is even indicated that, until complete gasification becomes an important factor, the intermittent vertical chamber may develop at the expense of the continuous vertical retort, provided adequate blending plant is installed and suitable coal distribution is arranged.

## A Better Answer

Processes of complete gasification provide a better answer to the problem of utilising weakly-caking coals for gas manufacture. Indeed, absence of caking power is an advantage, though not actually a necessity, in the processes which can be visualised from development work now in progress. Since 'total' gas consists mainly of carbon monoxide, hydrogen, and methane its combustion characteristics are simplified by the absence of higher hydrocarbons and utilisation problems are reduced.

The techniques now under examination are all of systems more suited for continuous operation. It follows that processes of complete gasification from bituminous coal are associated with large-scale production on base load and probably near the source of supply of the coal. Further, the techniques which show most promise of application in Great Britain are those which consume oxygen.

The postulated requirements of a mean calorific value near that of normal town gas, and of high thermal efficiency, have influenced the techniques in the direction of the use of a high pressure of 20 to 50 atm. Production of gas at this level of pressure has the advantage of providing the pressure necessary for transmission in long-distance pipelines. The cost of this transmission is considered to be only one-fifth of that necessary for the transport of coal by rail, when taken on the scale of 50 mill. or more cu.ft. of gas per day.

The techniques of complete gasification fall into three groups:—

(*a*) Static gasification in generators.

(*b*) Gasification in a fluidised bed.

(*c*) Gasification during entrainment in a gasifying medium. Group (*a*) is represented by the Lurgi process, which has achieved full-scale operation in Germany, using brown coal. Group (*b*) has so far been the subject of semi-scale investigation only. Group (*c*) has been developed in the atmospheric production of synthesis gas and has so far been confined to atmospheric pressure; two forms of it have reached the scale of pilot plant, but neither is adaptable to the manufacture of town gas of the required calorific value. One form of entrained gasification in which there is relative motion between the gasified solid and the entrained gas (the induced vortex) is still in the research laboratory, but holds promise of development to make town gas under pressure conditions.

It has not been established that British weakly-caking bituminous coals can be gasfied in the conventional Lurgi process, but the researches of the Gas Research Board are reassuring that a pressure of about 40 atm. would produce gas of the necessary calorific value from coals of the Types 802 and 900 (high volatile) and 201 (low volatile). From these coals it is calculated that 1 ton of coal (6% ash, 8% moisture) would yield 220 therms of gas at a calorific value of about 420 B.Th.U./cu.ft. and at an overall thermal efficiency (gas/total coal) of 0.68.

Research data further suggest that a modified process involving a double generator with intermediate drying of (and possibly $CO_2$ removal from) the gas required for hydrogenation would give a high gas yield at a pressure not necessarily exceeding 25 atm. A gas calorific value of about 500 B.Th.U./cu.ft. and a yield of 240 therms per ton of processed coal of Type 802 are forecast. Additional coal for power is calculated at 20%. The ammonium sulphate and sulphur yields would be high (105 and 30 lb. respectively); the tar yield would be 10 gal. but it might be more economic to return this to the generator in order to increase the gas yield by cracking.

## Fluidised Control of Solids

The fluidised techniques of control of finely-divided solids in reaction beds on a large scale has been shown to be applicable to the gasification of coal under pressure and under conditions in which methane is synthesised during the thermal decomposition of the coal. Only small-scale experiment has so far been attempted, but the technique is shown to hold considerable promise of full-scale application in a number of alternative ways and in association with the catalytic synthesis of methane from carbon monoxide and hydrogen. It could also lead to a method of production of gas of high enrichment value.

The application of the induced vortex to gasification reactions is still in the laboratory, and considerable fundamental work will be necessary before the stage is reached which will justify development work.

The new U.S. methods of manufacture of synthesis gas are not directly applicable to the production of town gas, but could be integrated into a process with this objective.

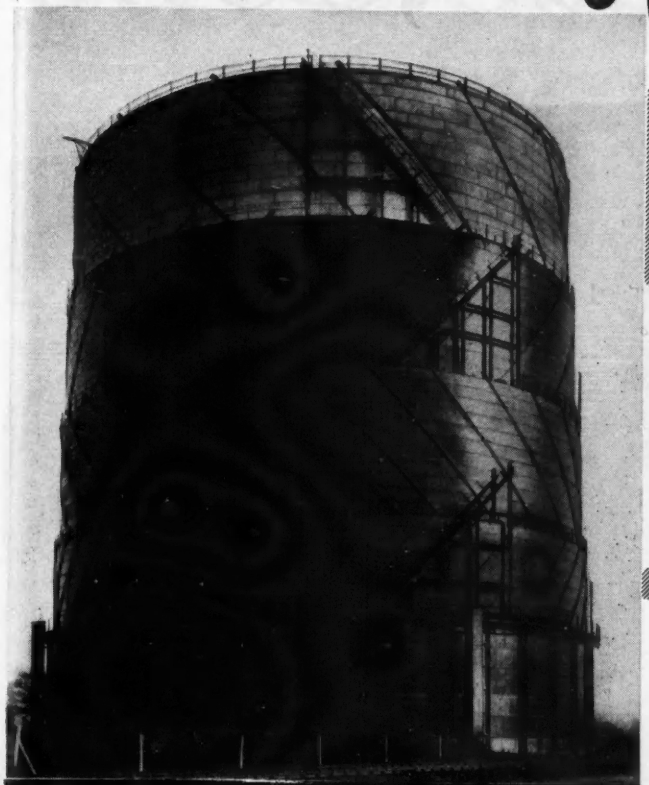
Sufficient data have been accumulated from semi-scale experiments to justify a greatly expanded effort on the development of a number of variations of the complete gasification of coal under pressure. The high rates of gas production reached by the hydrogenation of the volatile matter of coal indicate this to be the key procedure for integration into new processes. Alternative methods of production of hydrogen are required for this purpose.

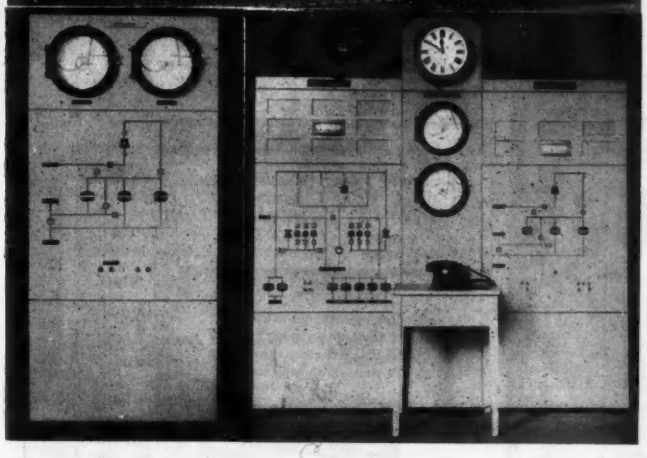
The rate of progress to date has been too slow and a considerable expansion of work on the development of full-scale technique is now urgently required.

---

**A New Coke Oven Battery** at the Midland, Pa., plant of Crucible Steel Company of America is to be designed and built by the Koppers Company, Inc.; 29 Koppers-Becker combination coke ovens will carbonise 490 tons of coal per day and will be underfired with either coke oven or blast furnace gas. Included in the contract are additions to the chemical recovery plant.

# Two Million Cubic feet





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Replacing a two lift standard guided Gasholder 155,000 cubic feet capacity in steel tank.

A further contract for a Gasholder of similar capacity at the Gas Works, Chesterfield, has also been received.

Illustrated on the left are the instrument panels with line diagrams at the Gasholder Station, WHITTINGTON and CHESTERFIELD.

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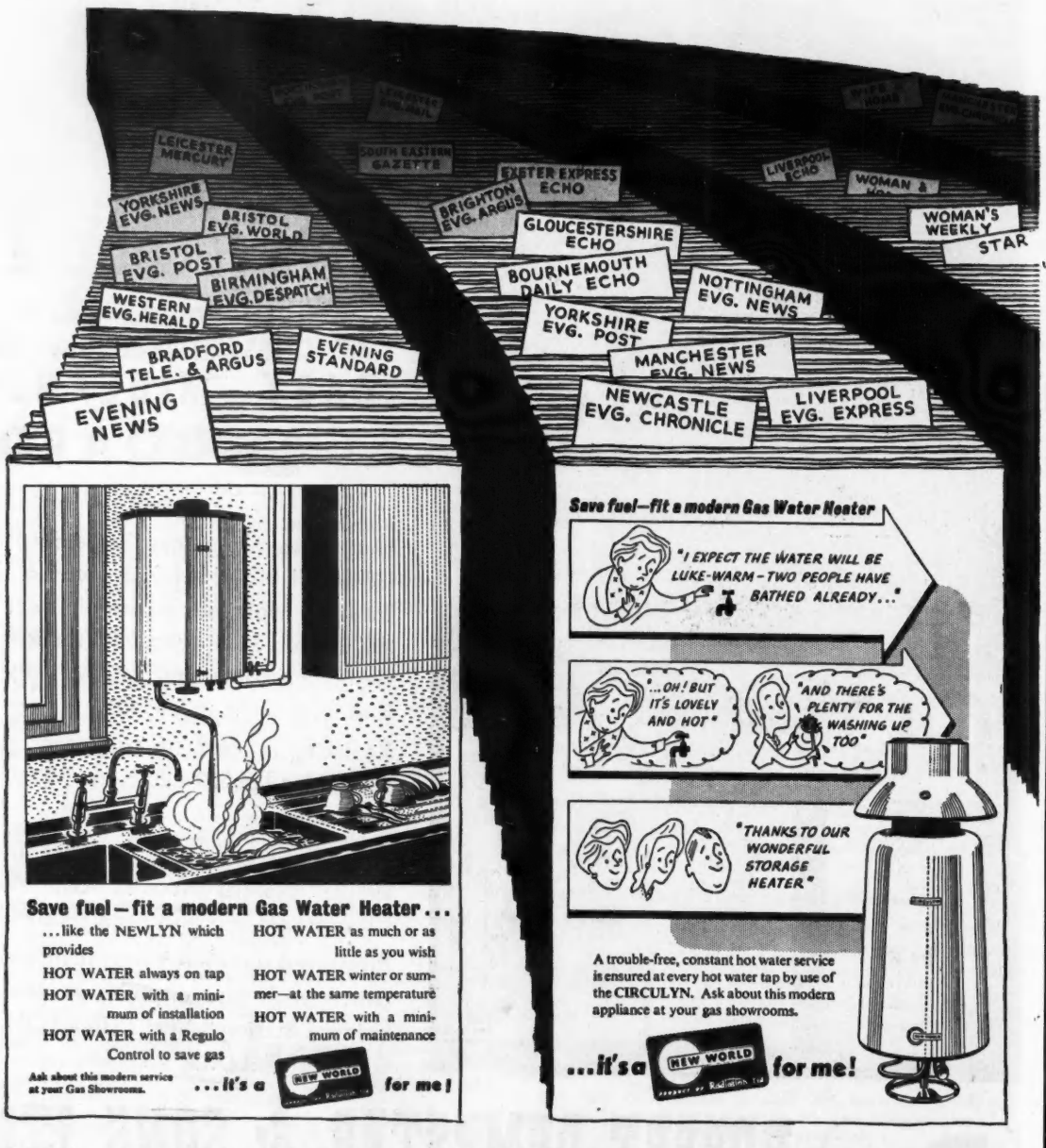
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STAR
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HOT WATER always on tap

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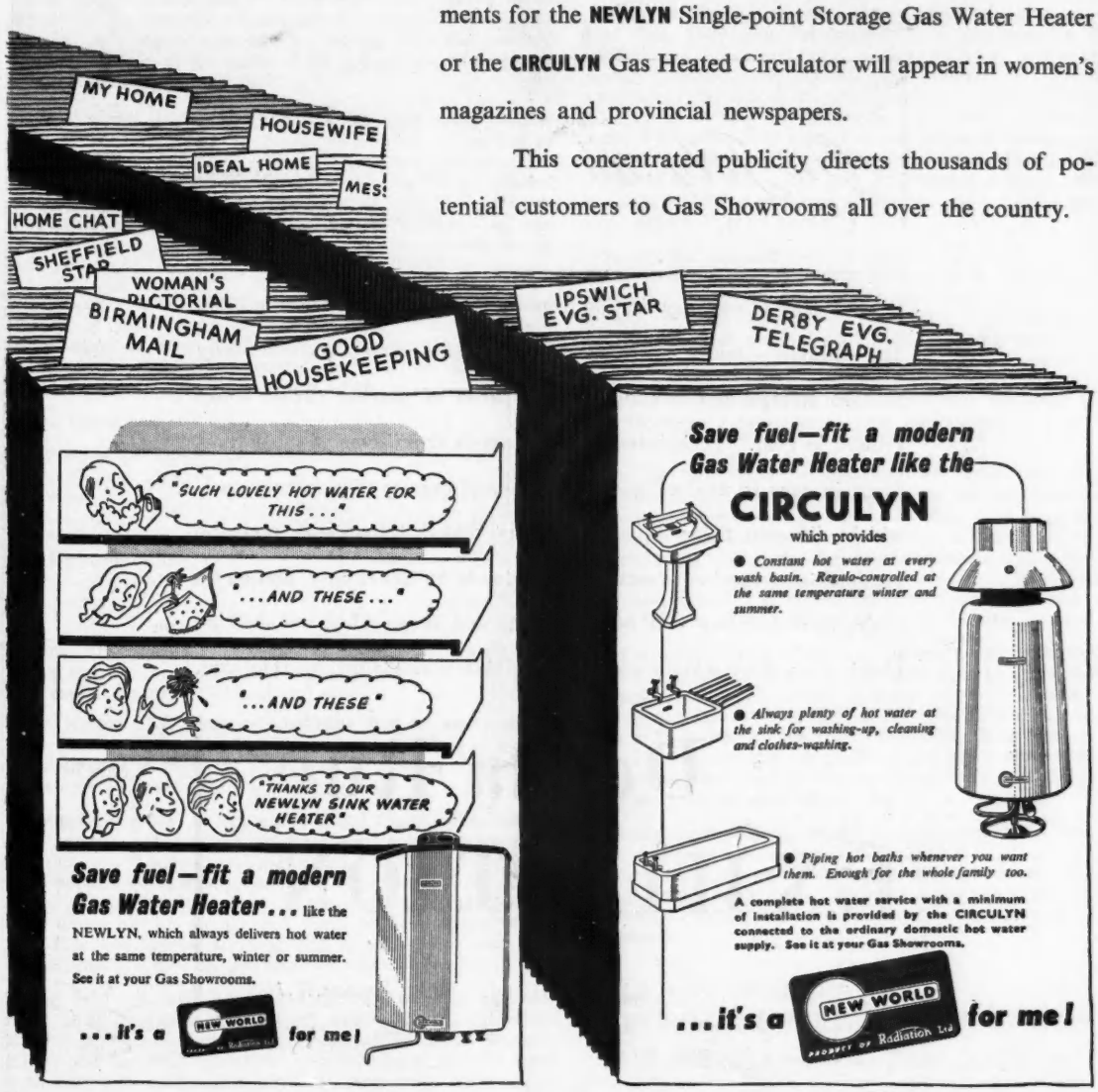
During the current period for Water Heater sales no fewer than 45 million impressions of **NEW WORLD** advertisements for the **NEWLYN** Single-point Storage Gas Water Heater or the **CIRCULYN** Gas Heated Circulator will appear in women's magazines and provincial newspapers.

This concentrated publicity directs thousands of potential customers to Gas Showrooms all over the country.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"SUCH LOVELY HOT WATER FOR THIS..."
"...AND THESE..."
"...AND THESE"
"THANKS TO OUR NEWLYN SINK WATER HEATER"
Save fuel—fit a modern Gas Water Heater... like the NEWLYN, which always delivers hot water at the same temperature, winter or summer. See it at your Gas Showrooms.
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● Constant hot water at every wash basin. Regulo-controlled at the same temperature winter and summer.
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NEW WORLD NEW WORLD NEW WORLD

*On July 5th...* the De La Rue Exhibition opens. Unique in the scope of its interest, it will tell the story of our organisation from the birth of the Founder in 1793. The exhibits—many of them are of great value—include early postage stamps and banknotes, rare packs of playing cards, books printed in gold. Their interest today ranges from some of the earliest fountain pens to modern gas appliances and the use of plastics in such widely different fields as cocktail bars, blood transfusion and the artificial insemination of cattle. Admission is by ticket only, and as we desire to make your visit both pleasant and memorable, we shall be glad if you will let us know which day and time is most convenient for you.

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# Capital Resources

By H. HAWORTH, M.Inst.Gas E., M.Inst.Chem.E., F.C.S.,
General Manager, Bolton Group, North Western Gas Board

**Extract from an address as Chairman of the Manchester and District Section of the Institution of Gas Engineers**

THE fuel crisis of 1947, followed by a second one from which we are just emerging, encourages me to embark on a dissertation which cannot claim originality but should claim the attention of every individual engaged in an industry which annually accepts 25½ mill. tons of the nation's most valuable capital asset and is entrusted with the privilege of supplying 85% of the homes of the country and the majority of industries with gaseous fuel.

The Gas Act, 1948, clearly defines our obligations, responsibilities, and privileges; the consumer can tell us whether or not he (or she) is prepared to accept the service we offer, but to us is entrusted the stewardship of accounting for the efficient conservation of irreplaceable raw material, and if we are not conducting our business with the utmost efficiency of our nation's capital resources, then we have no business to be in business.

Sir Harold Hartley told the British Association at its annual meeting at Birmingham in August, 1950, 'that the world's consumption of every kind of energy to-day—food for men and beasts, heat, light and power—needs a gross yearly intake equivalent to 4,000 million tons of coal.

This demand is met by:—

| | |
|---|---|
| Food from agriculture ... ... ... | 21 % |
| Coal and Lignite ... ... ... ... | 41 % |
| Wood ... ... ... ... ... | 6 % |
| Oil ... ... ... ... ... ... | 24.5% |
| Natural gas ... ... ... ... ... | 6.5% |
| Hydro-electricity ... ... ... ... | 1.0% |
| | 100.0% |

Thus 30% comes from 'current revenue' of plant and animal growth and water power, and the remainder from the 'capital resources' of coal and oil.

Sir Harold also issued a challenge that if men's minds were bent on the quest of plenty and not on quest of power, the scientists and engineers could create a new standard of life for people everywhere in the world.

Evidence provided by successive Royal Commissions on our coal reserves, exhortations by the country's leading scientists, and the almost monotonous persistence of fuel technologists in our own and allied industries almost denude me of the opportunity of focussing fresh light on the necessity to conserve an asset which has no annual seed time and harvest, but whose seed time and harvest are separated by millions of years and whose growth cannot be promoted by artificial fertiliser.

The Fuel Research Board and others have applied themselves towards greater efficiency of carbonisation, but I doubt if full advantage has been taken of their publications. Parochialism and financial limitation have prohibited many a local authority and smaller gas company from experimenting on what may have proved to be an economy, but now that coal, electricity, and gas are under national control a co-ordinated fuel policy affords a common approach towards the conservation of 'capital resources'.

The optimum coal stock cannot be gauged in a maximum winter week and quoted as equitable for all sizes of works. It must be fixed for each works according to its geographical position in relation to the supplying coalfields, its distance from the neighbouring works having regard to quantity to be provided, and its ability to meet requirements in an emergency.

In pre-nationalisation days (apart from emergency conditions from 1939 onwards) a gas undertaking being an independent unit concerned itself mainly with the obligation of meeting statutory requirements and secondly in presenting a satisfactory balance-sheet. Price increases were only resorted to when there was no alternative. Coal was purchased on contract from multiple sources as an insurance against breakdown in supplies and to provide assured continuity of gas service to the public. This may be regarded as good business at a time when it maintained selling competition and exercised some degree of price control.

To-day the coal and the gas industries are State controlled, therefore none of the foregoing advantages is available to the purchaser. The gas undertaking no longer buys from the colliery, but the area board buys from the National Coal Board. There is no fear that a single undertaking will be let down by a single colliery. The N.C.B. has accepted the responsibility to supply a works in total, and similarly the gas board, by its principle of bulk purchase, has made available the board's resources to meet emergencies at any or all of its works.

We all have bitter recollections of small proportionate deliveries of the 'bad' coal which on the first day produced a reduction in gas output, and the next three days were needed to recover from the ill effects of the coke in the producers and reduced heats, and when eliminated the whole setting claimed the time of the technical staff in readjustment to conditions of four days before. It would have been better to have consigned the coal to an economical user in the first instance.

An economical user is one who is able to adjust conditions so as to extract maximum thermal yield from an acknowledged low-grade fuel. It is better efficiency to get 60 therms from a 65 therm per ton fuel than to be satisfied with 65 therms from a 75 therm per ton fuel. Frequently in my experience such a coal may drop the make of gas equivalent to 8% to 10% within the space of two operative shifts, and that when the plant is being strained at 100%.

Outputs from collieries progressively streamlined to the small and medium-sized works would ensure supplies arriving regularly from one or two pits. Short supplies with attendant lifting from stock, and abundant supplies with heavy demurrage charges, would be reduced to a minimum if not eliminated.

## LARGEST SUPERPHOSPHATE WORKS

On April 27, Mr. Hervey Rhodes, D.F.C., M.P., Parliamentary Secretary to the Board of Trade, officially opened the new fertiliser factory built for Fisons, Ltd., at Immingham, Lincolnshire. This is the largest plant of its kind in Great Britain, and will make a very substantial contribution toward making this country as independent as possible of imported supplies of superphosphate. The Simon-Carves' Monsanto contact sulphuric acid plant is of the latest design, burning sulphur and employing vanadium pentoxide catalyst in a four-pass converter.

# *In well-designed kitchens...*

**The Main No. GF91 Gas-Heated DEEP FAT FRYER** illustrated is specially suitable for frying meats, rissoles, poultry, fish, potatoes, etc. It has a large-capacity one-piece pan of enamelled heavy cast-iron, a cool crumb-well being an important feature of the pan.

Its vitreous enamelled casing is fully-insulated and is mounted on vitreous enamelled cast-iron legs.

The Mainstat heat control and the temperature guide with splash-shield are located on the front.

The GF91 Fryer is complete with lift-off cover, wire basket, drain valve, main and pilot taps, burner and calorific-valve adjuster.

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*COMPANY MEETINGS*

# Parkinson and Cowan, Ltd.

## Sound Liquid Position: Sir George Jessel on a Year of Solid Progress

THE fifty-first annual general meeting of Parkinson and Cowan, Ltd., was held on May 11 in London.

Sir George Jessell, BT., M.C., the Chairman, in the course of his address, said:

Like all established businesses, our performance reflects not only the image of our own efforts but also the changing economic scene. The health of a company should today be judged not only by the surplus but to a large extent by the manner in which it was earned and the resilience of the organisation which earned it. By this standard we can claim a year of solid progress.

Our consolidated trading profit was £379,748 (£308,673 last year). After deducting taxation and all other charges our consolidated net profit was £122,741 (£80,307 last year). We anticipated increased taxation by including in our taxation reserve a larger amount than would be needed had pre-Budget rates been maintained.

After allowing for the 7% cumulative preference dividend there is a 25% return on our equity capital. Your Directors recommend that we repeat last year's ordinary dividend at the rate of 7%, and that we pay a bonus of 2%, subject to tax. There will remain a surplus of £68,136 on the year to be retained by the Group.

Our overall liquid position is a very sound one, with current assets exceeding all liabilities by more than £1,000,000.

### Group Operations

THE PARKINSON STOVE COMPANY, LTD.—Large sums of money are being spent in improved layout and new plant. We are also investing heavily in improving the working conditions in this factory by installing new heating equipment and modern boiler plant, by providing up-to-date washing facilities for our foundry workers, and by equipping a new works canteen and recreation room. When this is completed we believe that these works will be one of the finest domestic appliance plants in the country. We have a highly qualified staff of scientists and technicians from whom new and improved products are steadily flowing.

During this year we are introducing our new Paragon cooker, designed for the popular market. The technical performance of this cooker is outstanding and we think it will achieve a reputation comparable to that enjoyed by our famous Renown cooker in the higher price market. We are also introducing new space-heating appliances, the Nubic radiator for background heating in the home, and the Paraglow, a new portable fire.

MONITOR ENGINEERING COMPANY.—During the year we have made considerable advances in productive efficiency and our output of oil stoves and sprayers and gas stove accessories has risen. We have a number of new products in an advanced stage of development.

PARKINSON AND COWAN GAS METERS.—Here again we have achieved considerable advances in productive efficiency and our D range of gas meters have a technical performance which we believe to be unsurpassed by any meter produced in the world. We have increased our share of the available business both relatively and absolutely.

METROPOLITAN LEATHER COMPANY.—This company enjoyed satisfactory trading during the year. Our 'Multitest' meter diaphragms are being widely sold throughout the world.

ASPEC, LTD.—Our business in precision components continues to develop. Our clientele includes many well-known producers of instruments and watches. We believe that we have never yet left a customer dissatisfied with the quality of our mechanisms and components, and this is a class of business to which the old cliché 'quality first' really applies.

EXPORTS.—Our export division continues to progress. We believe that in terms of the percentage of our production sold overseas, our performance compares favourably with our competitors.

REARMAMENT WORK.—As the Government rearmament programme develops, we are taking our share of the burdens involved.

### New Acquisitions

During last year we purchased the business of the Rotoplunge Pump Company, Ltd., an old-established producer of positive pumps. This acquisition was in line with our policy to develop further interest in hydraulic engineering. We have laid down a small manufacturing plant for the production of pumps principally for chemical, oil, and industrial purposes. This business will contribute to our profits during the present year.

We recently acquired Messrs. Broadhead and Conyers, of Leeds, an old-established firm of leather tanners and dressers. The purchase will broaden our interest in the leather industry, in which, as you know, we have operated successfully for many years.

The report and accounts were adopted.

Regarding the Directorate, the Chairman said that Mr. E. Cowan had resigned to take up another appointment. The election of Mr. R. Connor to fill the vacancy was confirmed. Mr. B. R. Parkinson, after 40 years' association with the Company, did not seek re-election, and tribute was paid to his valuable services.

Mr. C. H. Pearson was appointed to the Board.

The Chairman concluded with thanks to the Managing Director, Mr. H. P. Barker, and to the staff and workpeople.

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## AUCKLAND

The annual meeting of the Auckland Gas Company was held at the Company's office on February 26, the Chairman of Directors, Mr. V. J. Larner, in submitting the annual report and accounts said: Manufacturing costs increased by £54,900 to £414,567. The price of coal was increased by the Government on May 8, 1950, from £3 per ton to approximately £5 per ton. Wages of employees were further increased by Arbitration Court Awards. The increase in our costs referred to is entirely due to these two factors. Increased plant efficiency in 1950, as compared with the previous year, enabled us to offset a portion of the extra costs. The credit balance for this year in the working account is shown at £53,846, compared with £57,282 the previous year, a decline of £3,436. Income and Social Security Tax to be deducted amount to £32,059, which leaves a balance of £21,787 to add to last year's carry forward of £15,230, making a total of £37,017 to be dealt with. A dividend of 4% is recommended, the same as last year. If this recommendation is adopted, it will absorb £21,294, leaving a credit balance to carry forward of £15,723.

Our new Glover-West gasmaking plant, in its second and possibly its best year, has proved successful beyond all expectations, giving results substantially in excess of the makers' guarantees. All products of the company—gas, coke, tar, and tar oil—maintained the highest quality throughout the year and were in abundant supply with 20% of the gasmaking plant held in reserve. Actual sales of coke exceeded the previous year's sales by 2,500 tons, and the total tonnage sold constitutes a record in the history of the Company.

## MONTEVIDEO GAS AND DRY DOCK

Dividend 5%, less tax (same). 1950. Profit, after providing tax £116,864 (£104,043) after crediting exchange profit £80,697 (£82,917), investment interest £3,753 (£4,796) and profit on disposal of fixed assets £8,066 (£697) and after charging depreciation £58,013 (£45,588), debenture and bank loan interest £19,709 (£12,977) and debenture issue expenses £17,098 (nil). Proposed dividend, less tax, will require £17,719 (£18,563). The Board state that it is already evident that the profit in 1950 will not be maintained during the current year. Negotiations for increase in the price of gas are in progress.

# CLAYTON SON & CO., LTD., HUNSLET, LEEDS

LANCASHIRE BOILER INSTALLATION

nearing completion—

BATH GAS WORKS



# PROTECTION

IN Chemical Works, Gas Works, Refrigerating plants, etc., the necessity for dealing with gas escapes and repair work calls for efficient protection of the men on the job. This is provided, in low concentrations of gas, by the "PURETHA" Respirator, which is comfortable, efficient and simple. Its canisters are coloured according to the gas or group of gases against which they give protection. Full mask and mouthpiece, nose-clip and goggles types.

For protection in confined spaces and high concentrations of gas, the company's well-known types of oxygen and compressed air self contained Breathing Apparatus are available. All other protective devices for the worker are also manufactured and supplied: Smoke helmets, short distance fresh air apparatus, resuscitating apparatus, dust masks, protective clothing, goggles, etc.

DIVING APPARATUS, BREATHING APPARATUS OF ALL TYPES, RESUSCITATING APPARATUS AND ALL INDUSTRIAL SAFETY APPLIANCES

Telephone: Elmbridge 5900

SIEBE, GORMAN & CO. LTD. LONDON

EVERYTHING FOR SAFETY EVERYWHERE

Telegrams: Siebe, Surbiton

TOLWORTH, SURBITON, SURREY

# Modern Gas Production Needs This

The modern trend is to effect economy in gas production and operation by creating large productive units with wide distribution networks. Large schemes can operate efficiently only by means of centralised information and control.

Evershed instrumentation meets this need. Its many systems of remote indication and control—each one designed for a specific purpose—enable the gas engineer to exercise adequate supervision of an undertaking by collecting and co-ordinating all relevant data at one central point.

*Examples of the advantages of Evershed instrumentation are:*

- **Remote Indication of Gas Holder Volume**
- **Indication at the producing plant of pressure at local distribution governors in high and medium pressure mains.**

*Ask us for Publication G. J. 23.*

EVERSHED CENTRALISED INFORMATION AND CONTROL FOR GAS UNDERTAKINGS

EVERSHED & VIGNOLES LIMITED
ACTON LANE WORKS: CHISWICK · LONDON · W4
Phone: Chiswick 3670. Grams, Megger, Chisk, London. Cables: Megger, London

6/20B

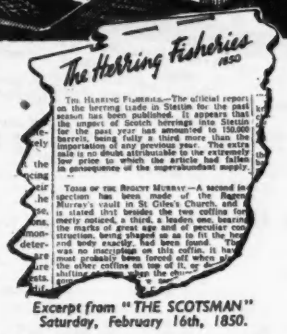
ONCE dermatitis gets to work—hands are soon out of work. Hands which are in constant contact with industrial irritants—bitumen, pitch, tar, oils, solvents, etc.—need a constant safeguard. By acting as a barrier against dermatitis, Rozalex keeps all hands active on the job. There is a type for every trade. Send for free sample and leaflet "The Skin in Industry" to Rozalex Ltd., 10 Norfolk Street, Manchester, 2.

ROZALEX

DERMATITIS BARRIER PREPARATIONS



# 100 years ago


The Herring Fisheries 1850

THE HERRING FISHERIES.—The official report on the herring trade in Stettin for the past season has been published. It appears that the import of Scotch herrings into Stettin for the past year has amounted to 150,000 barrels, being fully a third more than the importation of any previous year. The extra sale is no doubt attributable to the extremely low prices to which the article had fallen in consequence of the superabundant supply.

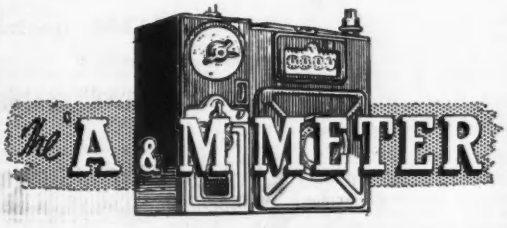
TOMB OF THE BOOKIE MURRAY.—A second inspection has been made of the Regent Murray's vault in St Giles's Church, and it is stated that besides the two coffins formerly noticed, a third, a leaden one, bearing the marks of great age and of peculiar construction, being shaped so as to fit the head and body exactly, had been found. There was no inscription on this coffin, it has most probably been forced off when the other coffins on top of it, or during shifting [illegible] upon the

Excerpt from "THE SCOTSMAN" Saturday, February 16th, 1850.

IN the case of perishable commodities such as herring, the law of supply and demand can often play havoc with price.

In the case of the technical product, price means nothing, until you know what it buys. In other words, the initial price does not signify the cost. The cost must be calculated per unit of satisfactory service.

**The "A. & M." Meter is specifically designed to meet the most exacting demands of the Gas Engineer. It embodies the most advanced devices research has produced; its performance is, above all, dependable, and behind it stands 100 years of progress and service unexcelled.**




CELEBRATING 100 YEARS' SERVICE TO THE GAS INDUSTRY

ALDER & MACKAY, LTD., *Gas Meter Manufacturers,*
EDINBURGH, BRADFORD, MANCHESTER, LONDON, BELFAST and CORK

**J. BROWN & CO. LTD.**
SAVILE TOWN, DEWSBURY, YORKS.
*Supply:–*
**"BROWNOX-de-LUXE" PURIFYING MATERIAL**
*Purchase:–*
**SPENT OXIDE**

Highest Activity will be obtained from
**DANISH BOG ORE**
Various grades supplied by
**AKTIEBOLAGET INDUSTRIMETODER**
U.K. OFFICE: 48 LOWNDES SQUARE, LONDON, S.W.1
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SPECIALISTS in ERECTION, DISMANTLING, ETC.,
GAS PLANT, GASHOLDERS, PURIFIERS,
FACTORY BUILDINGS, SHEETING, GLAZING.
**W.D. (SHEETERS) LTD.**
BARCLAYS BANK CHAMBERS, OWEN STREET, TIPTON
*Telephone: TIPTON 1958.* STAFFS.

**JOINTS, GASKETS, WASHERS,**
**in RUBBER or ASBESTOS**
**CENTRAL MANFG., & TRADING CO. (DUDLEY) LTD.**
**OLD HILL** **STAFFS.**
PHONE: CRADLEY HEATH 69181 (5 LINES).
*"EVERYTHING IN ASBESTOS."*

**RETORTS MADE GAS TIGHT**
*when patched with–*
**ONX** SUPER 83 BRAND FIRE CEMENT

A recent testimonial from Gas Dept.
"We are pleased with results obtained after using ONX Super '83' Brand.
"Our settings were very bad, with large cracks in retorts, and portions of wall actually collapsed.
"Now, six months after repairing 28 retorts they appear as sound as ever; we anticipate the life of the settings will be prolonged."

**A. L. CURTIS & CO.,** *Westmoor Works,* **CHATTERIS,** *Cambs., Eng.*

**"WASK" HIGH TENSILE**
**MALLEABLE PIPE FITTINGS**
OVER 4000 SIZES
INDIVIDUALLY AIR TESTED
STANDARD TAPER THREADS
FULL THICKNESS THROUGHOUT
*Fit and forget!*

MADE BY THE MAKERS OF–
"Wask" Up and Down Patent Lamp Suspenders, the NON-DISCONNECTING raising and lowering gear.
**WALTER SLINGSBY & CO., LTD.**
**NEW DAM WORKS - - - KEIGHLEY**
Phone: Keighley 3749 (2 lines). 'Grams: Malleable Keighley

**ALEXANDER WRIGHT & CO LTD**
1, Westminster Palace Gardens, WESTMINSTER, S.W.1
**INSTRUMENTS** for Works and Laboratory.
Gauges and Recorders; Main and Dial Thermometers; Orsats; Gas Testing Apparatus; S. G. Bell and Gravitometers; Recording Calorimeters; Boys' Calorimeters; GLCC Hygrometers; Wet Meters.

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**SPECIAL** quotations for
**SPECIAL** contracts by our
**SPECIALISED** photographic department.
**WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.** Telephone: Central 2236-7 Telegrams: Gasking Fleet

# PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price 1/-; by post 1/2d.

**NEW SUBSCRIPTION and CLASSIFIED ADVERTISEMENT RATES OPERATING FROM JAN. 1, 1951.**

**Subscription Rates:** Home and Empire :- 52/- per annum; Foreign :- 60/- per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

**Classified Advertisements:** All small classified advertisements are charged at 1/9 per line (approx. 7 words) - minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

**Displayed Advertisements:** Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep x 7" wide; block screen 120.

**BUSINESS MANAGER: S. T. CULLEN**

MIDLANDS OFFICE: 10, Union Street, Birmingham.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone: Harrogate 84291.

**WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.**

Telephone: CENtral 2236-7. Telegrams: Gasking, Fleet, London.



# OXIDE

DUTCH AND DANISH BOG ORE SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright. Highest prices paid for Spent Oxide. Send your enquiries to

**GAS PURIFICATION & CHEMICAL COMPANY LIMITED**

ESTABLISHED 1873

PALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

# "KLEENOFF"

THE COOKER CLEANER

Tins for Sale to Consumers. In Bulk for Works Use

OXIDE OF IRON

**BALE & CHURCH, LTD.**

7, CROMPTON WAY, MANOR ROYAL, CRAWLEY, SUSSEX.

Telephone CRAWLEY 12 Telegrams: "Balefire, Crawley."

# FIRE!

WHERE'S YOUR

# NU-SWIFT?

The World's Fastest Fire Extinguishers — for every Fire Risk

Pressure-operated by sealed $CO_2$ Charges

NU-SWIFT LTD. • ELLAND • YORKS

*In Every Ship of the Royal Navy*


## APPOINTMENT VACANT

**ENGINEER required for preparation of specifications and drawings for chemical plant tenders. Pension scheme. State experience and qualifications. No. 9963, *Gas Journal*, 11 Bolt Court, Fleet Street, London, E.C.4.**

**R. & A. Main Limited seek a man, age 30 to 40 with the requisite education, qualifications and background to assist the Firm's Technical and Scientific Adviser with a view eventually to taking over the post. A Science degree and previous experience in the Gas Industry definite advantages. Successful applicant would first study works' processes and thereafter be based in London with limited amount of travelling. Good salary and superannuation scheme. Applications, giving full particulars, which will be treated in confidence, to the Secretary, 48, Grosvenor Gardens, London, S.W.1.**

### SOUTH WESTERN GAS BOARD

NORTH DEVON SUB-DIVISION.

APPOINTMENT OF DISTRIBUTION SUPERINTENDENT, MINEHEAD AND WATCHET UNITS.

**APPLICATIONS are invited for the above appointment. Applicants should have a sound practical knowledge of gas fitting and mainlaying work, and possess the Higher Grade Certificate in Gas Engineering (Supply).**

The successful applicant will be responsible for the Mains, Service, and Fittings Departments, together with the interviewing of consumers.

The salary will be in accordance with Grade VII of the Board's Scale, viz.: £435 to £515.

Applications giving full particulars of qualifications and experience should be addressed to the undersigned not later than May 26, 1951.

J. H. LOWTHER,
Manager.

The Strand,
Barnstaple,
N. Devon.

### SOUTH WESTERN GAS BOARD

BATH SUB-DIVISION.

APPOINTMENT OF HOME SERVICE ADVISER.

**APPLICATIONS are invited for a HOME SERVICE ADVISER with the Bath Sub-Division.**

Candidates should possess a recognised Diploma and have experience in the giving of cookery and other ancilliary demonstrations, lecturing, running practical cookery classes and visiting consumers in their own homes to advise on the correct use of gas appliances.

The salary will be within the grade A.P.T. IV Provincial A, £200-£336 per annum.

Applications, stating age, qualifications and experience, and the names and addresses of two persons to whom reference can be made, should be received by the undersigned not later than Monday, May 28, 1951.

C. P. BATEMAN,
Manager.

18/19, Old Bond Street,
Bath.

### EASTERN GAS BOARD

IPSWICH DIVISION.

COLCHESTER UNDERTAKING.

**APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at Colchester Gas Works.**

Applicants should hold the Institution's Higher Grade Certificate in Gas Engineering (Manufacture) and have experience as well as the practical knowledge of general works operation, control of Continuous Vertical Retorts and drawing office and laboratory practice. Constructional experience will be an advantage.

Housing accommodation will be made available at a reasonable rental.

The salary will be in accordance with Grade VI, £415 to £495 per annum.

Applications, stating training, experience, qualifications and age, should be addressed to the undersigned to be received within fourteen days of the date of this advertisement. The application should give the names of two referees.

F. ALLEN,
Group Manager.

Eastern Gas Board,
Gas Works,
Colchester.

### TOWN COUNCIL OF SPRINGS

TRANSVAAL—SOUTH AFRICA.

**Town Engineer's Department.**

GAS WORKS SUPERINTENDENT.

**APPLICATIONS are invited from suitably qualified persons for the above position.**

The successful candidate will be required to supervise the erection of the Gas Works at present being constructed, and subsequently, totake full control of the gas undertaking under the Town Engineer.

The initial manufacturing plant will consist of automatically-operated C.W.G. plant.

Candidates are required to be qualified Gas Engineers, fully conversant with the production of both coal and water gas and to be competent to advise consumers upon the use of gas for industrial purposes.

The salary for the position is within the grade £870 x 30-£930, together with a variable cost of living allowance which, at the present time, is £14 0s. 0d. per month for a married man and £7 0s. 0d. per month for a single man. Thus, at the present time, the total salary grade applicable to a married man is £1,038 x 30-£1,098. This salary scale is subject to revision upon the development of the undertaking.

A contribution of £100 will be made towards the successful applicant's travelling expenses to South Africa. This amount, however, is subject to refund should the person appointed leave the service of the Council, for any reason, before the expiration of two years.

The successful candidate will be required to pass a medical examination prior to appointment and to join the Municipal Employees' Association and the Joint Municipal Pension Fund.

The successful applicant will be given the opportunity, if necessary, of acquiring a house under one of the Council's Selling Schemes.

Applications giving full details of training, qualifications and experience, together with *copies* of Testimonials and details of age and marital status, should be submitted to the Town Engineer, P.O. Box 45, Springs, Transvaal, South Africa, not later than **Friday, June 15th, 1951.**

Applications should be sent by airmail.

*(Classified advertisements continued on Supplement 4)*

## APPOINTMENTS VACANT (ctd.)

### WALES GAS BOARD

NEATH UNDERTAKING.

**APPLICATIONS are invited for the post of** TECHNICAL ASSISTANT in the above Undertaking.

Applicants should have a sound training in Gas Engineering and hold a Higher Grade Certificate of the Institution in Gas Engineering (Manufacture). They should have had experience in the operation of Continuous Vertical Retorts and Water Gas Plants.

The salary will be in accordance with Grade VII of the Board's scale of salaries (£450 to £530 per annum).

Successful candidate will be required to pass a medical examination and will be subject to the provisions of any superannuation scheme which the Board may introduce.

Applications, stating age, training, qualifications and experience, accompanied by the names of two referees, should be made to the undersigned not later than May 26, 1951.

G. FITTON,
Engineer & Manager.

Gas Works,
Millands,
Neath.

### EAST MIDLANDS GAS BOARD

SHEFFIELD AND ROTHERHAM DIVISION.
DONCASTER UNDERTAKING.
TECHNICAL ASSISTANT—MAINS.

**APPLICATIONS are invited from suitably** qualified persons for the position of TECHNICAL ASSISTANT in the Mains Department of the Doncaster Undertaking. Applicants should possess the Ordinary Grade Certificate in Gas Engineering (Supply) or its equivalent, and should be conversant with modern mainlaying technique and distribution practice. Salary will be within Grade A.P.T. IV of the National Salary Scales (£250-£420 per annum) and initial placing on the scale will be according to qualifications and experience.

The successful candidate will be required to submit to a medical examination and to participate in any superannuation scheme which may be introduced by the Board.

Applications, stating age, qualifications and details of experience, together with names of two referees, should be addressed to the undersigned to be received not later than May 26, 1951.

E. H. HARMAN,
Divisional General Manager.
Sheffield & Rotherham Division.

Commercial Street,
Sheffield, 1.
May 8, 1951.

### NORTH WESTERN GAS BOARD

LIVERPOOL GROUP.

**A VACANCY exists for a DRAUGHTSMAN in** the Industrial Gas Sales Department of the Group and applications are invited from suitably qualified persons.

The salary will be dependent upon qualifications and experience and will be within the range of £450-£530 per annum.

The following experience will be an advantage :—
Design of Industrial Gas Appliances and layout of installation work.
Furnace Construction.
Heating and ventilating engineering experience.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, appropriately endorsed, giving personal details and particulars of training, qualifications and experience, together with the names of two referees, should be addressed to the Chief Personnel Officer, North Western Gas Board (Liverpool Group), Radiant House, Bold Street, Liverpool, 1, within fourteen days of the publication of this advertisement.

### NORTH WESTERN GAS BOARD

MANCHESTER UNDERTAKING.
PARTINGTON WORKS.
SHIFT SUPERVISOR—
DRAKES HORIZONTAL RETORT HOUSE.
SHIFT SUPERVISOR—
WESTS VERTICAL RETORT HOUSE.

**APPLICATIONS are invited for Shift Super-**visors of Drakes Horizontal Retort House and Wests Vertical Retort House at the Partington Works.

The rate of pay and conditions of service will be in accordance with the North Western Area Council of the National Joint Industrial Council for the Gas Industry ; the present rate of pay being 28s. per shift (£9 16s. 0d. per week) for 48 hours.

Applications furnishing details of age, qualifications and experience, should be forwarded to the Group General Manager, Manchester Group, North Western Gas Board, Town Hall, Manchester, 2, so as to be received not later than seven days from the date of publication of this advertisement. Envelopes should be endorsed "Shift Supervisor—Drakes Horizontal Retort House," or "Shift Supervisor—Wests Vertical Retort House."

JOHN WILSON,
General Manager.

### SOUTH EASTERN GAS BOARD

KENT COUNTY DIVISION.
DISTRICT MANAGER, DOVER GROUP.

**APPLICATIONS are invited for the above-**mentioned position.

The duties will cover the day-to-day conduct of the Board's business with consumers in this Group and the successful applicant will be responsible directly to the Group Manager. The salary on appointment will be not less than £800 per annum.

Applications in writing (quoting reference V10/158), giving age, present occupation, experience, qualifications, etc., should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

### SOUTH EASTERN GAS BOARD

KENT COUNTY DIVISION.
MAINS SUPERINTENDENT,
MAIDSTONE GROUP.

**APPLICATIONS are invited for the above-**mentioned position. Applicants should have had extensive practical and theoretical experience in both high and low pressure gas distribution.

The commencing salary will be within Grade IX of the National Salary Scales (Provincial "A") in respect of Administrative, Professional and Technical Staffs (£520-£620 per annum) according to qualifications and experience.

Applications in writing (quoting reference V10/157), giving age, present occupation, experience, qualifications, etc., should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

### SOUTH EASTERN GAS BOARD

SUSSEX DIVISION.
ASSISTANT ENGINEER—HASTINGS.

**APPLICATIONS are invited for the above-**mentioned position.

Applicants must be Corporate Members of the Institution of Gas Engineers and have had practical experience in the supervision and maintenance of Gas Works Plant, including in particular Horizontal Retorts and the manufacture of Carburetted Water Gas and be accustomed to the control of labour.

The successful applicant will be required to deputise for the Engineer in his absence.

The commencing salary will be not less than £695 per annum.

Applications in writing (quoting reference V10/159), giving age, present occupation, experience, qualifications, etc., should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

### SOUTH EASTERN GAS BOARD

GAS ENGINEERING DRAUGHTSMEN—
EAST AND WEST SURREY DIVISIONS
(CROYDON AND WANDSWORTH).

**APPLICATIONS are invited for the above-**mentioned positions.

Commencing salaries will be according to qualifications and experience, and will be within the ranges:—

| | |
|---|---|
| £550-£650 per annum ... | Wandsworth |
| £445-£525 per annum ... | Wandsworth |
| £480-£560 per annum ... | Croydon |

All applicants must have had drawing office experience in the Gas Industry or with Gas Works Plant Contractors (a minimum of 10 years' such experience is necessary in the case of the higher paid position at Wandsworth). The ability to prepare drawings, specifications and estimates for the design and layout of Gas Works and Gas Distribution Plant, gas and steam mains, buildings, etc., is essential so far as both of the higher paid positions are concerned.

Applications in writing (quoting reference V10/153), giving age, present occupation, experience, qualifications, etc., should reach the undersigned not later than seven days after the publication of this notice.

Applicants should indicate for which of the above positions they desire to be considered.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

### NORTHERN GAS BOARD

STOCKTON DIVISION.
THE HARTLEPOOLS UNIT.
TECHNICAL ASSISTANT.

**APPLICATIONS are invited for the above** position at a salary within Grade A.P.T. V.

Applicants should have drawing office experience with a mechanical and/or civil engineering background.

Conditions of salary and service will be in accordance with the Agreement of the National Joint Council for Gas Staffs.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may subsequently adopt.

Applications stating age, qualifications and experience together with the names of two referees should be addressed to F. J. Webster, Engineer and Manager, Northern Gas Board, (Stockton Division), The Hartlepools Unit, Middleton Road, West Hartlepool, and should arrive not later than May 31, 1951.

F. L. SCAIFE,
Divisional General Manager.

### SOUTHERN GAS BOARD

PORTSMOUTH, GOSPORT AND BOGNOR
REGIS GAS UNDERTAKING.
DISTRICT MANAGER.

**APPLICATIONS are invited from suitably** qualified persons below the age of 40 years, for the position of DISTRICT MANAGER, at a commencing salary ranging between £570 and £670 per annum (A.P.T. X), inclusive of current War Bonus. Applicants should have served a period of pupilship or other instruction in the Sales and Fittings Department of a Gas Undertaking and the holding of theHigher Grade Certificate in Gas Engineering (Supply) of the Institution of Gas Engineers will be an advantage. The successful candidate will be expected to work to the direct instructions of the Sales Manager, to whom he will be a principal assistant, and the duties will include the control and training of all Gas Fitters, Apprentices and Maintenance Fitters working on the District of the Undertaking. Particular regard will be paid to a candidate's practical training and knowledge and his responsibility in this sphere in the immediate past.

The successful applicant will be expected to reside in a house which is the property of the Undertaking, at a reasonable rental for which will be paid by a suitable deduction from salary. He will be required to pass a medical examination.

Applications, stating age, whether married or single, qualifications, training and experience, together with the names of two persons from whom references may be obtained should be forwarded to the undersigned not later than May 31, 1951.

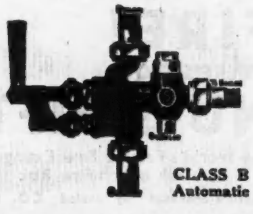
H. M. LAWRENCE,
General Manager.

Gas Offices,
The Square,
Portsmouth.
April 20, 1951.


**REPAIRS**

FOR PUBLIC LIGHTING
CLOCK CONTROLLER REPAIRS.
(A.I.D. approved)
**BRIGHT, SON & CO.**
(CLERKENWELL) LTD.
SUTTON WORKS, ARLINGTON AVENUE,
ISLINGTON, N.1
Cannonbury 2049 Brifulson, Nordo, London.

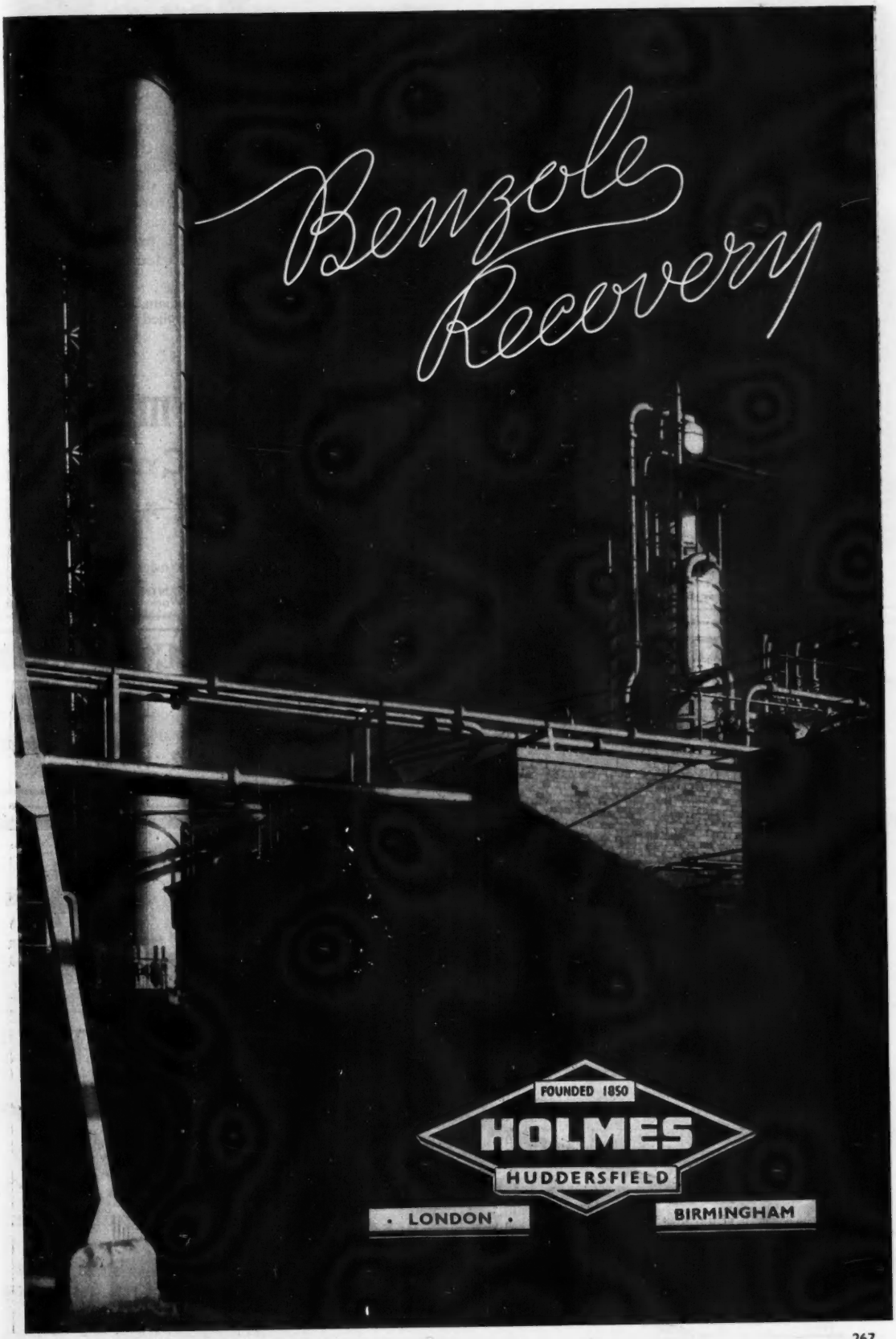
**BUFFALO INJECTOR**
(British Made)



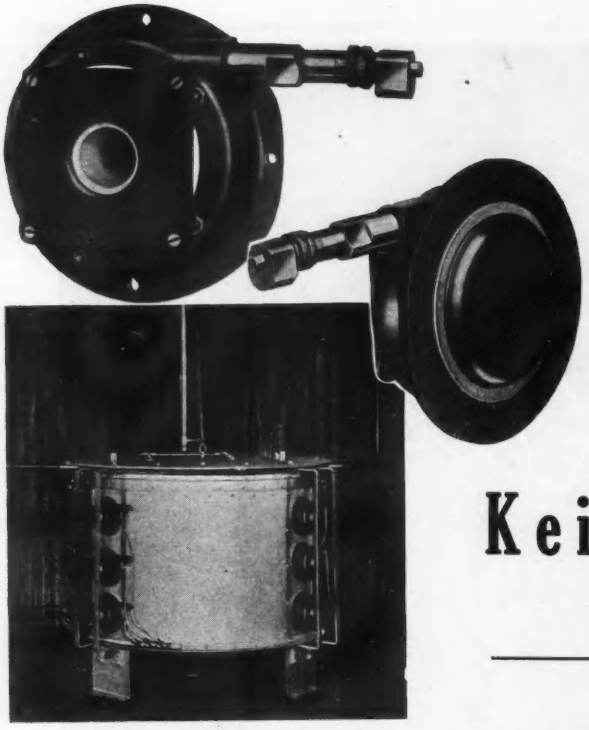
CLASS B
Automatic

Operated entirely by one handle

**GREEN & BOULDING, LTD.**
162a, DALSTON LANE, LONDON, E.8




Photograph by kind permission of the North Western Gas Board.



THIS is a medium temperature infra-red radiant heat burner for use on high pressure gas supplies only, say 3 to 5 lbs. per square inch, and it can be fitted to any type of oven or any travelling tunnel or stationary tunnel. A heat-resisting metal disc of about 4 inches diameter forms the radiant and operates at a bright red heat. The disc is mounted in a cast iron holder, and each holder is fed by its own high pressure injector. Gas consumption is about 20 cubic feet per hour.

THE illustrations show, at the top, both sides of the KEITH BLACKMAN and Radiant Disc Burner, and at the bottom six of twelve burners applied to a paint drying oven.

# Keith Blackman
## RADIANT DISC
## —GAS BURNER—

*Price on application*

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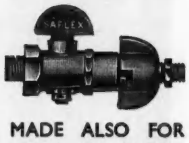


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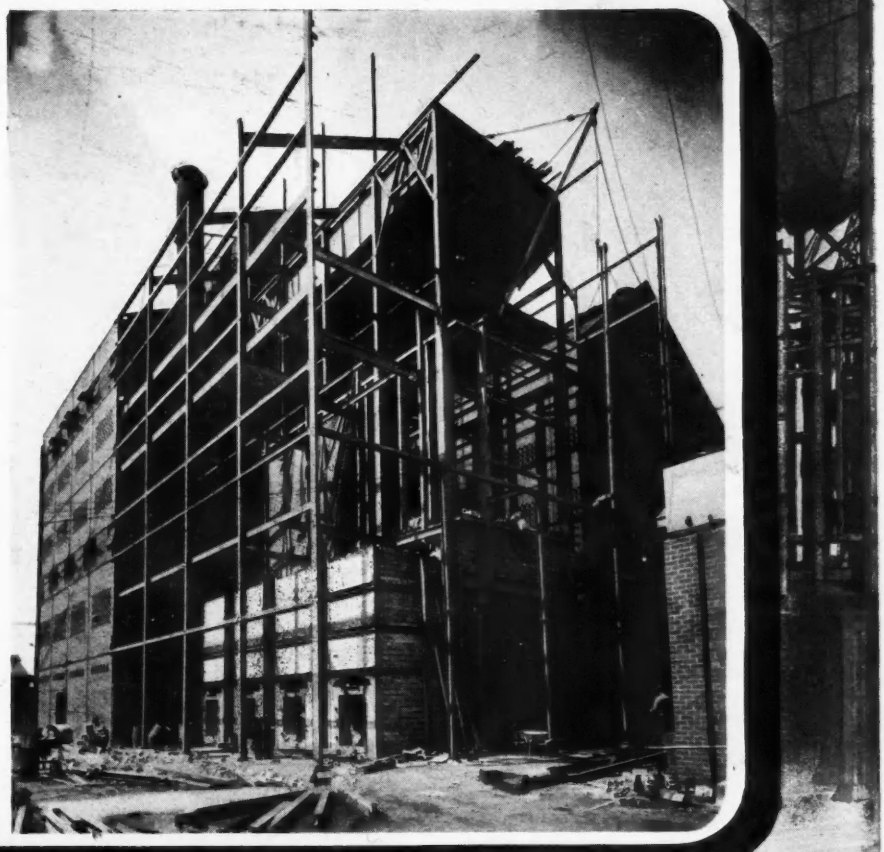

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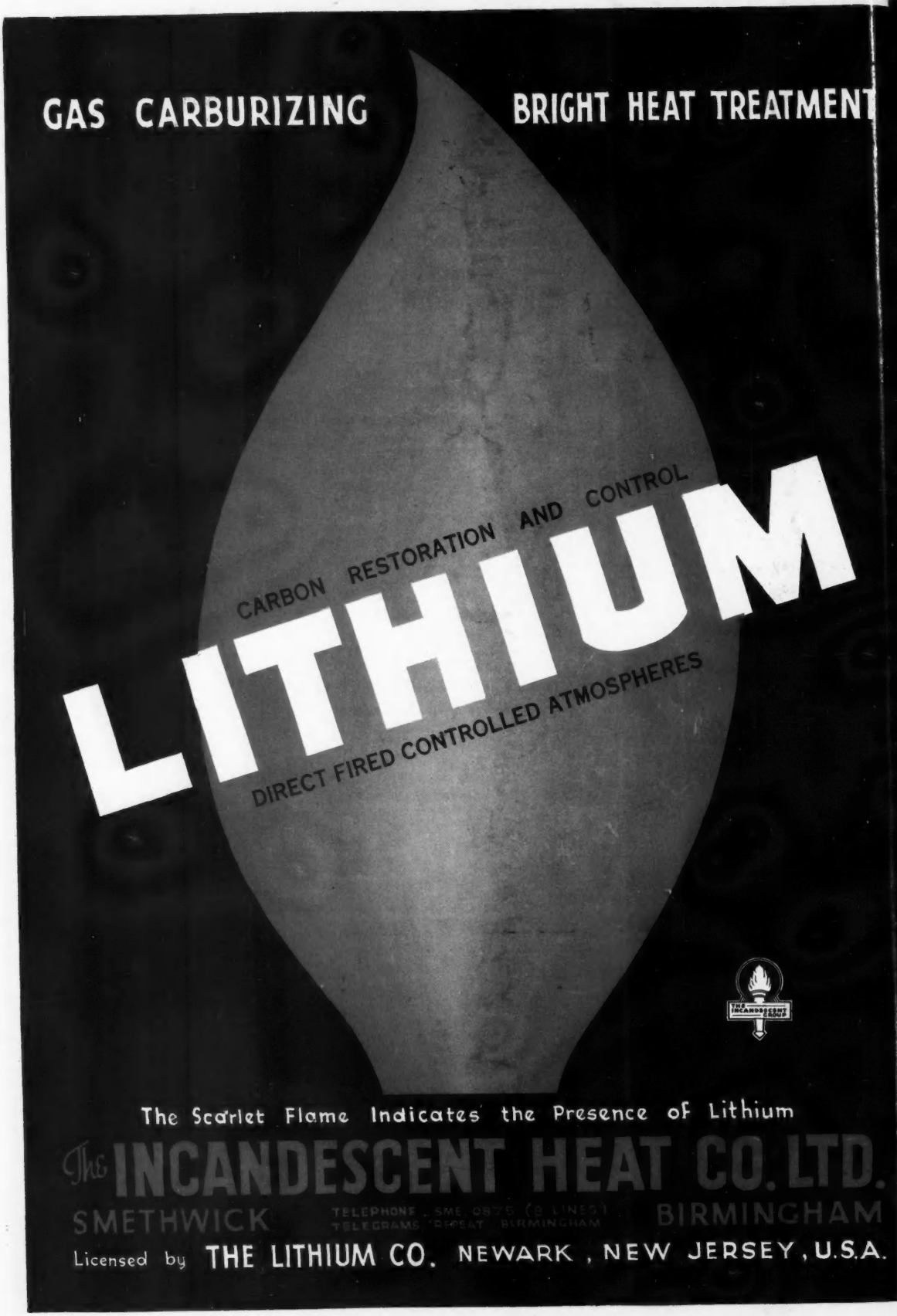
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